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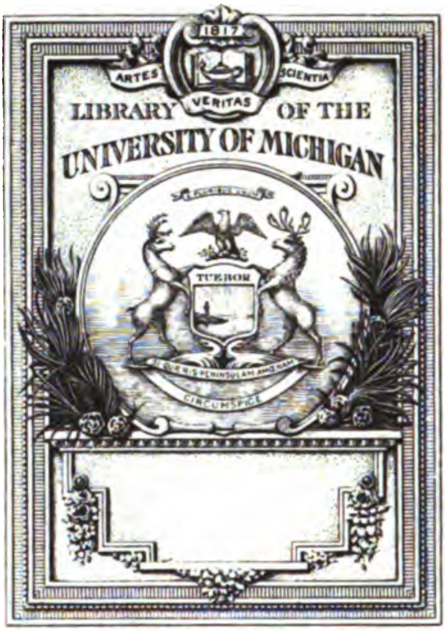
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JOINT DOCUMENTS

JOINT DOCUMENTS

74372

OF THE

STATE OF MICHIGAN

FOR THE YEAR 1896

IN FIVE VOLUMES

VOL. III

BY AUTHORITY

LANSING
ROBERT SMITH & CO., STATE PRINTERS AND BINDERS

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1. Fourteenth annual report of the Bureau of Labor and Industrial Statistics of Michigan, year ending February 1, 1897.

2. Fourth annual report of Inspection of Factories in Michigan, made under direction of the Bureau of Labor and Industrial Statistics.

3. Twelfth biennial report of the State Board of Fish Commissioners from December 1, 1894, to December 1, 1896.

4. Sixth biennial report of the Live Stock Sanitary Commission for the years 1895 and 1896.

5. State of Michigan Land Department; report of the Commissioner for the fiscal year ending June 30, 1896.

6. Report of Quartermaster General of the State of Michigan from July 1, 1894, to June 30, 1896.

7. Annual report of the State Salt Inspector of the State of Michigan for the year ending November 30, 1896.

FOURTEENTH ANNUAL REPORT

OF THE

74372

BUREAU OF LABOR

AND

INDUSTRIAL STATISTICS

OF

MICHIGAN

YEAR ENDING FEBRUARY 1, 1897

BY AUTHORITY

LANSING
ROBERT SMITH PRINTING CO., STATE PRINTERS AND BINDERS
1897

BUREAU OFFICIALS.

CHAS. H. MORSE, Commissioner of Labor, - - - - -	Gratiot County
H. R. DEWEY, Deputy Commissioner of Labor, - - - -	Genesee County
L. S. RUSSELL, Chief Clerk, - - - - - - -	Van Buren County
FLORENCE ORBISON, Stenographer - - - - - -	Gratiot County

OFFICIAL ADDRESS, - - - LANSING, MICH.

LETTER OF TRANSMITTAL.

STATE OF MICHIGAN,
Bureau of Labor and Industrial Statistics,
Lansing, Mich., February 1, 1897.

Hon. Hazen S. Pingree,
Governor of Michigan:

Sir—In compliance with the provisions of section 2, act 156, session laws of 1883, I have the honor to transmit herewith the fourteenth annual report of the Bureau of Labor and Industrial Statistics.

Very respectfully,
CHAS. H. MORSE,
Commissioner of Labor.

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INTRODUCTORY.

PREFATORY REMARKS.

The Michigan Bureau of Labor and Industrial Statistics, in its work the past year, has made a specialty of gathering statistics relating to the manufacturing of all kinds of vehicles in common use. Michigan vehicle manufacturers produce nearly everything in that line, from the finest carriages and wagons down to wheelbarrows—from pleasure sleighs and " lumber bobs " to children's hand sleds. There are also large manufacturing concerns which produce only parts of vehicles, such as springs, spokes, hubs, bent work, etc. These were all included in the canvass of more than 6,000 people employed in this industry.

PART I.—VEHICLE MANUFACTURERS AND EMPLOYES.

This part is devoted to the vehicle industry. The results of the canvass are shown in Tables 1 and 2, and the deductions following, which will more than repay the time spent in studying them.

PART II.—EIGHT HOUR DAY.

The question of reducing the hours for labor is attracting much attention. Careful inquiry has been made of employers and employés canvassed the past year, to get the individual opinion of each. They have responded quite generally.

In addition, Mr. Samuel Gompers, President of the American Federation of Labor and a recognized leader among the advocates of shorter working days, was invited to furnish an article for this report on this subject. The employers of labor have a deep interest in this question, and Hon. George H. Barbour, vice president and general manager of the Michigan Stove Company, one of the largest employers of labor in the State, was invited to give his views on the subject.

The whole of Part II will be found very interesting to every person interested in this matter.

PART III.—FOREST STATISTICS.

Early in the year it was decided to make an investigation regarding the forests remaining in Michigan. The appropriation at the disposal of the Bureau would not permit this to be done by personal representatives of the Bureau. It was also a question how far the inquiry should be carried. It was finally decided to undertake the investigation through supervisors of townships and limit it, ascertaining the acreage of timber subdivided into pine, hemlock and hardwood, with inquiries as to the amount of plains and swamp partly timbered. Reports of townships with accompanying remarks, and the deductions therefrom, ought to command attention.

Many states are taking steps to preserve their remaining forests from wanton destruction by fire, and if possible to promote new growth. Officers styled Fire Wardens and Forestry Commissions have charge of this work, and are accomplishing good results.

Unquestionably Michigan must give this matter attention in the near future, or the State once second to none in amount and value of its timber will be nearly as treeless as the "prairie states." The Minnesota law for preservation of her forests seems particularly applicable to Michigan and is published in full for the benefit of those who are taking an interest in this important matter. The last annual message of Governor Rich invites the attention of the legislature to this matter of forestry, and makes pertinent recommendations. Land Commissioner French, also, in his last annual report calls attention to the practicability of utilizing the cheap lands of the State for the reproduction of forests. There is very little doubt that at a moderate expense a large amount of land now almost valueless may be made to yield valuable returns in the not remote future.

PART IV.—PENAL AND REFORMATORY INSTITUTIONS.

Including the Detroit House of Correction, Michigan has six of these institutions, with an aggregate population, November 30, 1896, of 2,888 inmates, beside 288 officers and employés.

Reports from wardens and superintendents cover quite fully the cost of maintaining inmates, occupations at which they are employed, salaries paid officers and employés, and other matters of minor importance. These reports also show the number of inmates employed on contract, number employed on "State account," number employed about the institutions and the number idle.

The communications from the Superintendents of the Industrial School for Boys and the Industrial Home for Girls, cover briefly, but quite fully, the plans pursued with the boys and girls in those institutions. Perhaps the State is accomplishing more good for the money invested in these institutions than in any other. Under the able management of Mr. J. E. St. John and Mrs. Lucy M. Sickels, a large percentage of the boys and girls under their charge are saved from a life of crime.

PART V.—STRIKES.

Strikes in Michigan of sufficient magnitude to command general attention have been very limited in number. The reports given in Part V are nearly all made by a representative of this Bureau, and are doubtless correct.

PART VI.—DECISIONS OF COURTS.

The National Department of Labor issues a bi-monthly bulletin containing decisions of courts affecting labor interests. These are too voluminous to reproduce in full in this report. However, the more important have been selected for publication, and will doubtless be interesting to many of the people of Michigan. Among those published is the decision of the Michigan Supreme Court, sustaining act No. 136, session laws of 1887. This act is commonly known as the "Blower Law."

REMARKS.

The Commissioner is under many obligations to a large number of persons in all parts of the State for valuable suggestions and assistance in gathering statistics, not only in the past year, but during the entire four years of his administration.

The many courtesies extended him by State officers are cheerfully acknowledged.

Without exception the clerks who have been employed in the compilation have displayed more than usual intelligence and industry.

Hon. H. R. Dewey, Deputy Commissioner, Mr. L. S. Russell, Chief Clerk and Miss Florence Orbison, stenographer, have rendered very valuable assistance during all the years tney have been connected with this Bureau. The marked ability they have displayed in the discharge of every official duty is fully appreciated.

PART I.

EMPLOYES OF VEHICLE MANUFACTURING ESTABLISHMENTS.

Table No. 1 has been prepared from statistics gathered by a personal canvass of 4,650 employés engaged in the manufacture of various kinds of vehicles in Michigan. These statistics have all been tabulated, but only 4,000 are published in this report. These people are employed in 134 establishments and in 38 cities and villages. There are 103 occupations reported. It will be a surprise to those unacquainted with this kind of manufacturing to see how the work of making a carriage is classified and divided among employés.

Detroit, Flint, Grand Rapids, Jackson, Kalamazoo, Lansing, Owosso and Pontiac are the cities where the largest vehicle manufactories are located, and the people canvassed are largely residents of the cities above named.

Wages do not vary to any considerable amount in different cities and establishments. This industry has suffered like nearly everything else from the business depression of the past three years. As a result, many firms have been "closed down" for longer or shorter periods—reduced the number of their employés and cut wages. A study of the table will show that these people are suffering their share from "hard times."

It is believed that persons interested in the social and material welfare of our laboring population will find the deductions following this table interesting. Nationality of employés, domestic relations, wages, total earnings, time employed or idle, savings, information relative to homes and manner of living are given. Fraternal associations, and benefits derived therefrom, together with fire, life and accidental insurance show the care these people are taking of themselves. A careful study of this table and its deductions will amply pay for the time consumed.

In making this canvass, care was taken in selecting canvassers, to employ those from whom, by their general intelligence and standing with employers and employés, satisfactory service might be expected.

The following schedule was used. These schedules, as returned by the several canvassers, are classified and on file in the Michigan Labor Bureau and are open to inspection and warrant the deductions published in this report:

MICHIGAN BUREAU OF LABOR AND INDUSTRIAL STATISTICS, 1896.

STATISTICS OF EMPLOYES OF MANUFACTURERS OF VEHICLES.

---

1. Residence..
   (*Give town or city only.*)
2. Age..
3. Nationality..
4. If foreign born, how many years in the United States?..
5. Married or single..
6. No. in family.....Adults?......Children?......
7. By what corporation, firm, or individual are you employed?..
8. What is the nature of your work?..........................
9. How many hours constitute a day's work?.....
10. Do you work by the day, week, month, or on piece work, which?..........................
11. Average earnings per day..........................
12. Can you earn more than enough to comfortably support yourself and family?..................
13. How many days' time have you lost in past year?..
14. How much have you earned in past year?......
15. How much have you saved in past year?......
16. Cause of lost time..
17. Do you work overtime?..........................
18. Do you receive extra pay for overtime?........
19. Is it at same rate as for regular time?.........
20. How often are wages paid?..........................
21. Are any wages withheld under certain rules?..
22. Do *you* favor eight hours for a day's work?....
23. Do *you* favor eight hours for a day's work with corresponding reduction in wages?............
24. Do *you* think you can accomplish as much work in eight hours as in ten?..................
25. Do *you* think the average employé can accomplish as much work in eight hours as in ten?.
26. Considering amount of work and wages, are times better or worse than two years ago? Which?..
27. Are they better or worse than one year ago? Which?..
28. Has cost of living been increased or decreased in past two years?..........Which?............
29. Has cost of living been increased or decreased in past year?............Which?..............
30. Do you own a home?..........................
31. Is it clear of incumbrance?......................
32. If in debt for a home is it on contract or mortgage?..
33. How much is the debt?....Rate of interest?....
34. Do you meet the payments?......................
35. Do you keep it insured against fire?............
36. If renting a home, how much per month?......
37. To what fraternal organization do you belong?
    ....
38. Is there life insurance attached to it?.........
39. Have you other life insurance?..................
    Accidental?..
40. To what labor organization do you belong?....
41. Does it have a funeral benefit?..................
    Sick benefit?..........Strike benefit?..........
42. Does its effect tend to increase wages?.........
43. Do you favor restricting foreign immigration?
44. Does foreign immigration injure your present occupation?..

Add remarks, if any, on other side of this sheet.

As will be seen, the schedules with which the information was gathered contained forty-four questions. Care was taken in formulating this schedule with a view to place before the readers accurate data of this class of laborers, which would be valuable in reaching conclusions. Tables are often dull to the average reader, and knowing this an effort has been made to make the deductions which follow not only interesting, but valuable. The work has been classified as follows:

1. Relative to residence, age, nativity and social condition.
2. Relative to where employed and nature of work.
3. Relative to hours of labor and wages.
4. Relative to loss of time, earnings, savings and over time.
5. Relative to an eight-hour day.
6. Relative to times.
7. Relative to living.
8. Relative to homes.
9. Relative to fraternal organizations and insurance.
10. Relative to labor organizations and benefits.
11. Relative to foreign immigration.

Where nationalities are not spelled out in full, the following abbreviations are used:

Am., American.
Can., Canadian.
Ger., German.
Eng., English.
Hol., Hollander.
Pol., Polander.
Nor., Norwegian.
Boh., Bohemian.
Ir., Irish.
Scot., Scotch.
Wel., Welsh.
Fin., Finlander.
Prus., Prussian.
Aus., Austrian.
Neth., Netherlander.
Bel., Belgian.
Ita., Italian.
Rus., Russian.
Fr., French.
Swe., Swede.
Swi., Swiss.

Those canvassed resided in the following towns and cities in the State

Albion.
Allegan.
Battle Creek.
Bay City.
Benton Harbor.
Buchanan.
Charlotte.
Coldwater.
Detroit.
Escanaba.
Flint.
Grand Rapids.
Ionia.
Iron Mountain.
Jackson.
Jonesville.
Kalamazoo.
Lansing.
Lapeer.
Linden.
Lowell.
Manistee.
Marshall.
Monroe.
Mt. Clemens.
Northville.
Ovid.
Owosso.
Plymouth.
Pontiac.
Rochester.
Romeo.
Roseville.
Saginaw.
South Lyon.
Three Rivers.
Traverse City.
Wayne.
White Pigeon.
Wyandotte.
Ypsilanti.

Book No. 1. **Table No. 1.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1	G'd Rapids	35	Am.	----	m	2	--	Manager	yr.	9	no	$7 00	none	----------------	$2,191	------
2	"	42	"	----	"	2	-	"	day	9	"	4 00	"	----------------	1,252	none
3	"	46	"	----	"	2	4	"	yr.	10	"	3 20	"	----------------	1,002	"
4	"	32	"	----	s	--	-	"	day	10	yes	4 00	"	----------------	1,252	$600
5	"	37	"	----	w	1	1	"	"	10	no	3 00	"	----------------	939	none
6	"	34	"	----	m	2	--	"	wk.	10	"	3 33	"	----------------	1,042	"
7	"	27	"	----	s	--	-	"	"	10	"	2 50	"	----------------	1,082	100
8	"	51	"	----	m	2	3	"	day	10	"	2 50	"	----------------	783	200
9	Detroit	29	"	---	"	3	2	"	yr.	24	----	2 75	"	----------------	861	none
10	"	67	"	----	"	2	--	"	day	10	no	2 50	"	----------------	782	100
11	Marshall	55	"	----	"	2	2	"	mo.	10	"	5 75	"	----------------	1,800	------
12	Linden	64	"	----	"	2	3	"	day	10	"	2 50	"	----------------	782	200
13	G'd Rapids	36	"	---	"	2	2	Sec'y-Treas.	yr.	10	yes	8 00	"	----------------	2,500	500
14	"	33	"	----	s	--	--	Supt.	day	10	no	3 00	"	----------------	939	300
15	"	50	"	----	m	3		"	yr.	11	yes	8 00	"	----------------	2,500	------
16	"	39	"	---	"	2	3	"	day	10	no	3 00	"	----------------	969	200
17	"	30	Irish	28	"	2	--	"	"	10	yes	2 75	"	----------------	880	------
18	"	48	Am.	----	w	1	4	"	"	10	no	3 00	4	Lack of work	927	none
19	"	44	Eng.	25	m	2	4	"	yr.	10	"	4 49	none	----------------	1,400	"
20	"	31	Am	----	"	2		"	day	9	"	3 00	"	----------------	939	"
21	"	32	"	----	s	-		"	"	10	yes	4 00	78	Sickness	940	"
22	"	39	"	---	w	1	1	"	yr.	10	"	5 00	none	----------------	1,565	600
23	"	33	Ger.	13	m	2	5	"	day	10	"	4 50	"	----------------	1,408	450
24	"	35	Am.	----	"	2	2	"	yr.	10	"	10 00	"	----------------	3,130	2,000
25	"	21	"	----	s		--	"	wk	8½	no	2 00	104	Lack of work	418	60
26	"	57	Pol.	42	m	2	--	"	day	10	"	2 50	none	----------------	783	------
27	"	34	Am.	----	"	2	3	"	wk.	10	"	3 00	"	----------------	939	------
28	"	40	"	----	"	2	5	"	day	10	"	2 00	"	----------------	626	100
29	"	44	"	----	"	2		"	"	10	"	2 50	"	----------------	782	100
30	"	40	"	----	"	2	--	"	"	10	"	2 50	"	----------------	782	350
31	Jackson	43	Eng.	29	"	2	3	"	yr.	10	"	3 20	"	----------------	1,000	------
32	"	40	Can.	16	"	2	-	"	"	10	yes	4 00	13	Pleasure	1,200	400
33	"	35	Am.	---	"	2	1	"	"	10	no	4 00	none	----------------	1,252	none
34	"	32	"	----	"	2	-	"	wk.	10	yes	3 00	"	----------------	939	300
35	"	38	"	---	"	2	4	"	yr.	10	"	3 33	"	----------------	1,000	200
36	Kalamazoo	56	"	----	"	2	1	"	day	10	----	4 00	30	Lack of work	1,132	300
37	"	39	"	----	"	2	2	"	"	10	no	5 00	none	----------------	1,565	700
38	"	37	Can.	18	s	-	--	"	"	10	"	3 75	"	----------------	1,174	500
39	"	41	"	20	m	2	3	"	yr.	10	"	5 00	"	----------------	1,565	600
40	"	53	"	30	w	1	--	"	day	10	yes	4 25	"	----------------	1,330	-----
41	Detroit	33	Am.	----	m	2	-	"	yr.	10	"	3 00	"	----------------	939	------
42	"	45	"	----	"	2	--	"	"	10	no	5 00	"	----------------	1,565	800
43	"	56	Can.	22	"	2		"	mo.	12	yes	3 25	"	----------------	1,000	500
44	Lansing	47	Am.	--	"	2	--	"	yr.	10	-	3 50	"	----------------	1,095	------
45	Three Rivers	45	Can.	25	"	5	2	"	"	10	yes	6 39	"	----------------	2,000	none
46	Marshall	23	Am.	----	s	--	--	"	day	10	"	2 00	20	----------------	586	300
47	Jonesville	41	"	----	m	2	4	"	yr.	10	no	3 19	none	----------------	1,000	200
48	White Pigeon	42	"	----	"	2	1	"	--	10	"	2 00	20	----------------	586	none
49	Wayne	43	Can.	16	"	2	1	"	wk	10	"	2 75	20	Sickness	806	50
50	G'd Rapids	40	Am	----	"	2	4	Foreman	"	10	"	3 33	none	----------------	1,040	none

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	yes	yes	----	----	----	----	yes	----	yes	yes	None	----	----	----	----	----	----	**1**
s-mo	"	no	mort	$1,700	7	yes	"	----	no	no	"	----	----	----	----	yes	yes	**2**
wk.	no	----	----	----	----	----	----	$7 00	yes	"	"	----	----	----	----	no	no	**3**
"	yes	yes	----	----	----	----	yes	----	no	"	"	----	----	----	----	"	"	**4**
"	no	----	----	----	----	----	----	10 00	yes	"	"	----	----	----	----	yes	yes	**5**
"	"	----	----	----	----	----	----	12 00	no	"	"	----	----	----	----	"	"	**6**
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	**7**
"	yes	yes	----	----	----	----	yes	----	yes	"	"	----	----	----	----	"	"	**8**
dem.	no	----	----	----	----	----	----	12 00	"	"	"	----	----	----	----	"	"	**9**
s-mo	"	----	----	----	----	----	----	15 00	"	"	"	----	----	----	----	"	"	**10**
mo.	yes	yes	----	----	----	----	yes	----	"	"	"	----	----	----	----	"	"	**11**
wk.	"	no	mort.	600	7	yes	"	----	"	yes	"	----	----	----	----	"	"	**12**
dem.	"	"	"	1,500	7	"	"	----	"	"	"	----	----	----	----	"	no	**13**
wk.	"	"	"	400	7	"	"	----	"	no	"	----	----	----	----	"	"	**14**
"	"	"	"	3,000	7	"	"	----	"	yes	"	----	----	----	----	"	yes	**15**
"	"	"	"	400	7	"	"	----	"	no	"	----	----	----	----	"	"	**16**
"	no	----	----	----	----	----	----	7 00	"	yes	Metal Pol. Union	no	no	yes	yes	"	"	**17**
"	yes	no	mort.	----	8	yes	yes	----	"	no	None	----	----	----	----	"	"	**18**
"	"	yes	----	----	----	----	"	----	"	"	"	----	----	----	----	"	"	**19**
s-mo.	"	no	mort.	1,700	7	yes	"	----	no	"	"	----	----	----	----	"	"	**20**
wk.	----	----	----	----	----	----	----	----	yes	"	"	----	----	----	----	"	no	**21**
"	no	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	yes	**22**
s-mo	yes	yes	----	----	----	----	yes	----	yes	"	"	----	----	----	----	"	"	**23**
"	"	no	mort	1,000	6½	yes	"	----	"	"	"	----	----	----	----	"	no	**24**
"	----	----	----	----	----	----	----	----	"	yes	"	----	----	----	----	"	yes	**25**
wk.	yes	yes	----	----	----	----	yes	----	"	no	"	----	----	----	----	"	no	**26**
"	no	----	----	----	----	----	----	12 00	"	"	"	----	----	----	----	no	"	**27**
"	yes	no	----	500	6	yes	yes	----	"	"	"	----	----	----	----	yes	yes	**28**
"	no	----	----	----	----	----	----	10 00	"	"	"	----	----	----	----	"	"	**29**
"	yes	no	mort.	1,000	7	yes	yes	----	no	"	"	----	----	----	----	"	"	**30**
"	"	"	"	1,100	6	"	"	----	yes	"	"	----	----	----	----	no	no	**31**
s-mo.	no	----	----	----	----	----	----	13 00	"	"	"	----	----	----	----	yes	"	**32**
wk.	"	----	----	----	----	----	----	11 00	no	----	"	----	----	----	----	no	"	**33**
"	"	----	----	----	----	----	----	10 00	yes	no	"	----	----	----	----	yes	"	**34**
s-mo.	"	----	----	----	----	----	----	14 00	"	----	"	----	----	----	----	"	"	**35**
wk.	yes	yes	----	----	----	----	yes	----		----	"	----	----	----	----	"	yes	**36**
"	"	"	----	----	----	----	"	----	yes	----	"	----	----	----	----	"	"	**37**
"	no	----	----	----	----	----	----	10 00	"	----	"	----	----	----	----	"	"	**38**
s-mo.	yes	yes	----	----	----	----	yes	----	"	----	"	----	----	----	----	"	no	**39**
mo.	"	no	----	1,500	7	yes	"	----	no	no	"	----	----	----	----	"	----	**40**
s-mo.	no	----	----	----	----	----	----	12 00	yes	"	"	----	----	----	----	"	no	**41**
"	yes	yes	----	----	----	----	yes	----	"	----	"	----	----	----	----	"	yes	**42**
wk.	no	----	----	----	----	----	----	16 00	"	----	"	----	----	----	----	"	----	**43**
s-mo.	yes	no	mort.	1,200	7	yes	yes	----	"	no	"	----	----	----	----	"	yes	**44**
wk.	no	----	----	----	----	----	----	10 00	"	"	"	----	----	----	----	"	no	**45**
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	**46**
s-mo.	yes	yes	----	----	----	----	yes	----	yes	"	"	----	----	----	----	"	"	**47**
"	no	----	----	----	----	----	----	6 00	"	"	"	----	----	----	----	"	yes	**48**
"	yes	no	mort.	300	7	yes	yes	----	"	"	"	----	----	----	----	"	"	**49**
wk.	no	----	----	----	----	----	----	6 00	"	yes	"	----	----	----	----	no	no	**50**

Book No. 2. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
51	G'd Rapids	30	Dane	7	m	2	1	Foreman	day	10	yes	$3 00	none	----	$939	none
52	"	41	Hol.	26	"	2	4	"	"	10	no	1 75	48	Lack of work	499	"
53	"	35	Ger.	16	"	2	4	"	"	10	"	2 00	none	----	626	"
54	"	48	Am.	----	s	--	--	"	"	10	"	1 40	35	Lack of work	389	"
55	"	47	Ger.	44	m	2	4	"	"	10	"	2 00	42	" "	542	"
56	"	45	Am.	----	s	--	--	"	"	10	yes	2 50	52	Pleasure	653	"
57	"	29	"	----	m	2	1	"	"	10	"	4 00	none	----	1,280	"
58	"	27	"	----	"	2	--	"	"	10	"	2 50	24	Sickness	745	"
59	"	60	"	----	"	2	1	"	mo.	---	"	4 00	none	----	1,296	$600
60	"	30	"	----	"	2	--	"	day	----	"	3 00	78	Lack of work*	738	none
61	"	25	"	----	s	--	--	"	"	10	no	2 00	78	" "	470	"
62	"	31	"	----	m	2	1	"	"	10	yes	2 25	none	----	792	200
63	"	36	Can.	15	"	2	3	"	"	10	"	2 50	"	----	880	none
64	"	43	Am.	----	"	2	1	"	"	10	"	2 25	60	Sickness	657	50
65	"	45	"	----	"	2	1	"	wk.	10	"	3 00	none	----	939	none
66	"	46	Ger.	40	"	2	4	"	day	10	no	2 50	"	----	783	100
67	"	52	"	33	"	2	3	"	"	10	yes	2 50	"	----	820	200
68	"	36	Am.	----	"	2	2	"	wk.	10	"	3 00	"	----	984	300
69	"	26	"	----	s	--	--	"	day	10	no	2 50	12	Pleasure	753	100
70	Kalamazoo	30	Hol.	28	m	2	1	"	"	10	"	2 50	none	----	783	175
71	"	46	Can.	20	"	2	--	"	"	10	----	4 50	"	----	1,408	400
72	"	41	"	18	"	2	2	"	"	10	no	4 00	"	----	1,252	50
73	"	42	"	19	"	2	1	"	"	10	"	4 00	"	----	1,252	500
74	"	48	Am.	----	"	2	5	"	"	10	"	3 00	"	----	939	50
75	"	55	"	----	"	2	3	"	"	10	"	2 00	"	----	626	210
76	"	35	"	----	"	2	2	"	"	10	"	2 75	10	Lack of work	833	100
77	"	38	"	----	"	2	2	"	"	10	"	2 25	none	----	704	140
78	"	45	"	----	"	2	2	"	"	----	"	3 60	"	----	1,127	500
79	"	38	Fr.	30	"	2	3	"	"	10	"	3 00	"	----	939	200
80	Jackson	33	Am.	----	"	2	--	"	"	10	yes	2 50	6	Pleasure	768	75
81	"	35	"	----	"	2	2	"	"	10	no	3 00	none	----	939	none
82	"	22	"	----	s	--	--	"	wk.	10	"	2 25	"	----	704	"
83	"	30	"	----	"	--	--	"	"	10	yes	2 50	"	----	783	150
84	"	31	"	----	m	2	1	"	day	10	"	2 00	"	----	626	125
85	"	44	"	----	"	2	6	"	"	10	no	3 00	"	----	939	none
86	"	30	"	----	"	2	4	"	"	10	"	2 25	"	----	704	"
87	"	47	Can.	30	"	2	--	"	yr.	10	"	3 00	"	----	939	"
88	Flint	53	Am.	----	"	4	2	"	day	10	yes	2 25	12	Other business	677	100
89	"	32	"	----	"	2	3	"	wk.	10	"	2 25	none	----	704	250
90	"	45	"	----	"	2	--	"	day	10	no	3 00	"	----	939	none
91	"	45	"	----	"	2	2	"	"	10	yes	2 75	30	Pleasure*	776	"
92	"	30	"	----	"	2	1	"	yr.	10	no	3 00	none	----	939	150
93	"	29	"	----	"	2	2	"	day	10	yes	2 25	30	Accident	637	------
94	"	29	"	----	"	2	2	"	"	10	no	2 37	10	Vacation	720	none
95	"	38	Can.	14	"	2	2	"	"	10	yes	2 37	none	----	743	300
96	"	26	Am.	----	"	2	--	"	"	10	"	2 25	3	Vacation	698	200
97	"	28	"	----	s	--	--	"	"	10	"	2 00	5	"	616	none
98	Three Rivers	53	"	----	m	2	2	"	"	10	no	2 75	6	Lack of work	844	104
99	"	38	"	----	"	2	2	"	"	10	"	2 85	6	" "	876	250
100	"	54	"	----	"	2	--	"	yr.	10	"	6 39	none	----	2,000	500

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	no								yes	no	None					yes	yes	51
"	yes	no	cont.	$700	7	yes	yes		"	"	"					no	no	52
"	"	"	mort.	425	7	"	"		"	yes	"					yes	yes	53
"									no	no	"					"	"	54
"	yes	no	mort.	140	7	yes	yes		"	"	"					"	"	55
"									"	"	"					"	"	56
"	no							$12 00	yes	"	"					"	"	57
"	"							8 00	"	"	"					"	"	58
mo.	yes	yes					yes		"	"	"					"	"	59
wk.	no							8 00	"	"	"					"	"	60
"									no	"	"					"	"	61
s-mo.	yes	no	mort.	700	7	yes	yes		yes	"	"					"	"	62
"	"	"	cont.	700	7	"	"		"	"	"					"	"	63
"	"	yes					no		"	"	B. of B. M.	no	no	no	yes	"	"	64
"	no							9 00	"	"	None					"	"	65
wk.	yes	yes					yes		"	"	"					no	no	66
"	"	no	mort.	400	7	yes	"		"	"	B. of B. M.	no	no	no	yes	yes	"	67
"	"	"	"	500	7	"	"		"	"	None					"	yes	68
"									no	"	"					"	"	69
"	no							8 00	yes		"					no	no	70
mo.	"							10 00	no		"					yes	yes	71
"	yes	yes					yes		yes	no	"					"	no	72
"	no							10 00	"		"					"	yes	73
wk.	"								"		"					"	"	74
"	yes	yes							"		"					"	"	75
"	"	"					yes		"		"					"	"	76
s-mo.	no							10 00	"		"					"	"	77
"	yes	no	cont.	300	7	yes	yes				"					"	"	78
"	no							10 00			"					"	"	79
wk.	"							12 00	yes	no	"					"	no	80
"	yes	no	mort.	1,000	7	yes	yes		"	"	"					"	yes	81
"									no	"	"					"	no	82
"									yes	"	"					"	"	83
"	yes	yes					yes		"	"	"					"	yes	84
s-mo.	no							20 00	"		"					"	"	85
"	"							12 00	"	no	"					"	"	86
"	"							10 00	"		"					no	"	87
wk.	yes	yes					yes		"	yes	"					yes	"	88
"	"	no	mort.	625	6	yes	"		"	no	"					"	no	89
"	"	yes					"		"	"	"					"	yes	90
"	no							12 00	"	"	"					"	"	91
"	"							10 00	"	"	"					"	no	92
s-mo.	yes	no	cont.	500	7	yes	yes		"	yes	"					"	"	93
"	"	yes					"		"	"	"					"	yes	94
"	"	"					"		"	no	"					no	no	95
"	"	no	cont.	150	7	yes	"		"	"	"					yes	"	96
"									no	"	"					"	yes	97
wk.	no							8 00	yes	yes	"					no	no	98
"	yes	no	mort.	300	6	yes	yes		"	"	"					yes	"	99
"	"	yes					"		"	no	"					"	"	100

Books Nos. 3 and 4. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
136	G'd Rapids.	22	Am.	----	s	--	--	Stenog'r....	wk.	9	no	$1 33	20	Lack of work	$391	$65
137	"	26	"	----	"	--	--	" ----	mo.	10	"	2 00	none	----------	626	------
138	"	25	"	----	"	--	--	" ---	wk.	8½	"	1 50	"	----------	470	150
139	"	19	"	----	"	--	--	" ----	"	8½	"	90	52	Lack of work	235	25
140	"	20	"	----	"	--	--	" ----	"	8½	"	1 17	6	Pleasure	359	------
141	"	20	"	----	"	--	--	" ----	"	8½	"	1 83	18	" * ----	540	------
142	"	20	"	----	"	--	--	" ----	"	8½	yes	1 00	none	----------	313	100
143	"	26	"	----	"	--	--	" ----	day	8	no	1 25	156	Sickness	196	------
144	"	16	"	----	"	--	--	" ----	wk.	8	"	1 20	none	----------	376	none
145	Pontiac	40	"	----	"	--	--	" ----	"	8	"	1 50	10	Sickness	455	20
146	" ----	29	"	----	"	--	--	" ----	"	8	"	1 33	3	" ----	413	------
147	Jackson	27	"	----	"	--	2	" ----	"	9	"	1 66	none	----------	520	------
148	" ----	20	"	----	"	--	--	" ----	day	8	"	50	62	Various......	126	40
149	Marshall ...	22	"	----	"	--	--	" ----	wk	10	yes	1 50	none	----------	470	100
150	Saginaw, W.S.	18	"	----	"	--	--	" ----	"	10	"	58	"	----------	182	------
151	Detroit.....	19	"	----	"	--	--	" ----	day	9	no	1 00	104	At school.....	209	none
152	Battle Creek.	20	"	----	"	--	--	" ----	wk.	10	yes	1 08	26	Sickness......	310	25
153	Three Rivers.	28	"	----	"	--	-	" ----	"	10	"	2 00	none	----------	626	150
154	Kalamazoo.	18	"	----	"	--	--	" ----	day	8	----	1 00	"	----------	313	100
155	G'd Rapids.	40	"	----	m	2	3	Bookkeeper	yr.	9	no	3 20	"	----------	1,000	none
156	"	24	"	----	s	--	--	"	mo.	10	"	2 90	"	----------	908	------
157	"	40	Eng.	7	m	2	-	"	wk.	10	yes	2 00	"	----------	626	none
158	"	24	Am.	----	s	--	--	"	"	8½	no	1 25	"	----------	391	"
159	"	23	"	---	"	--	--	"	day	10	"	1 50	"	----------	470	"
160	"	27	"	----	m	2	1	"	wk.	10	"	1 00	"	----------	313	"
161	"	23	"	----	"	2	--	"	day	10	"	2 00	"	----------	626	100
162	"	35	"	---	"	2	--	"	"	10	"	1 50	"	----------	470	none
163	"	43	"	----	"	2	5	"	"	10	"	4 00	12	Pleasure*	1,204	200
164	Kalamazoo.	36	"	----	s	--	--	"	----	10	"	2 00	none	----------	626	45
165	"	40	"	----	m	2	1	"	day	10	"	2 25	"	----------	704	15
166	"	24	"	----	s	--	--	"	"	10	"	1 50	"	----------	470	80
167	"	55	"	--	m	5	3	"	"	10	---	4 82	------	----------	1,500	500
168	"	39	Eng.	24	"	2	1	"	"	10	no	2 75	none	----------	860	50
169	"	26	Am.	----	"	2	--	"	"	10	"	2 25	"	----------	704	150
170	Jackson	53	"	----	"	2	--	"	yr.	10	yes	3 83	"	----------	1,200	500
171	" ----	23	"	----	s	--	--	"	wk.	10	"	1 50	"	----------	470	none
172	Three Rivers.	21	"	---	"	--	--	Clerk.......	"	10	"	94	"	----------	294	"
173	" "	31	"	----	m	2	--	Bookkeeper	yr.	10	"	2 88	"	----------	900	100
174	Detroit.....	33	"	----	"	2	1	"	mo.	---	----	4 00	------	----------	1,252	200
175	Pontiac	25	"	----	s	--	--	"	day	8	no	1 25	10	Vacation.....	381	------
176	Flint	25	"	----	m	2	1	"	wk.	10	yes	2 00	none	----------	626	none
177	Jonesville..	24	"	----	s	--	--	"	mo.	10	no	1 75	"	----------	548	100
178	Traverse City	22	"	----	"	-	--	"	day	7	----	1 00	"	----------	313	------
179	Wayne	27	"	----	"	--	--	"	wk.	9	no	1 30	"	----------	407	none
180	G'd Rapids.	29	"	----	m	2	--	Cashier.....	mo.	9½	"	2 00	"	----------	626	------
181	Kalamazoo.	33	"	----	s	-	--	Salesman...	yr.	----	----	4 82	"	----------	1,500	800
182	"	36	"	----	m	2	2	" --	"	----	----	3 85	"	----------	1,200	400
183	"	38	"	----	"	2	1	" --	"	----	----	3 85	"	----------	1,200	200
184	"	36	"	----	"	2	1	" --	"	----	----	4 00	"	----------	1,252	400
185	"	45	"	----	"	2	-	" --	"	----	no	3 51	"	----------	1,100	400

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.									yes	yes	None							136
mo.									no	no	"					yes	yes	137
wk.	yes	yes					yes		"	yes	"					"	no	138
"									"	no	"					"	"	139
s-mo.									"	"	"					"	yes	140
"									"	"	"					"	no	141
"									"	"	"					"	yes	142
wk.	yes	yes					yes		"	"	"					"	"	143
"									"	"	"					no	no	144
"									yes	"	"					yes	"	145
"	no							$7 00	"		"					"	"	146
s-mo.	"							8 00			"					"		147
wk.											"					"	no	148
s-mo.											"					"	yes	149
wk.											"					"	"	150
"											"					"		151
"									yes	no	"					"	no	152
"											"					"	yes	153
"											"					no	no	154
"	yes	yes					yes		yes	no	"					yes	"	155
mo.									no	"	"							156
wk.	no							9 00	yes	"	Iron Mould's U'n	yes			yes	yes	no	157
s-mo.									no	"	None					"	"	158
wk.	yes	yes					yes		"	"	"					"	yes	159
"	no										"					"	"	160
"	"							7 00	no	no	"					"	no	161
"	yes						yes		"	"	"					"	yes	162
"	no							25 00	yes	"	"					"	no	163
"									"		"					"	yes	164
"	yes	yes					yes		"		"					"	"	165
"											"					"	"	166
mo.	yes	yes					yes				"					"	"	167
wk.	"	no	mort.	$600	7	yes	"				"					"	"	168
"	no							8 00			"					"	"	169
"	"							14 00	yes	yes	"					"	no	170
"									no	no	"					"	yes	171
"									"	"	"					"	no	172
"	no							6 00	yes	"	"					"	yes	173
"	yes	yes					yes				"					"	no	174
"											"					"	"	175
"	yes	yes					yes		yes	no	"					"	yes	176
s-mo.									"	"	"					"	no	177
											"							178
s-mo.											"					yes	yes	179
wk.	yes	no	mort.		7	yes	yes		yes	no	"					"	"	180
dem.									"		"					"	"	181
"	yes	yes					yes				"					"	"	182
"	"	"							yes		"					"	"	183
"	"	"					yes				"					"	"	184
"	"	"					"				"					"	"	185

Books Nos. 4 and 5. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
186	Kalamazoo	40	Am.	----	s	--	--	Salesman	yr.	--	----	$3 82	none		$1,195	$600
187	G'd Rapids	32	"	----	"	--	--	"	mo.	10	no	3 90	"		1,211	------
188	"	42	"	----	m	2	2	"	"	10	"	5 75	"		1,800	------
189	"	48	"	----	"	4	--	"	yr.	----	no	3 20	"		1,000	none
190	Linden	36	"	----	"	2	2	"	day	10	yes	2 50	"		782	300
191	Flint	42	"	----	"	2	--	"	wk.	10	no	2 00	50	Accident	520	160
192	Marshall	31	"	----	"	2	--	"	mo.	10	yes	4 80	none		1,500	------
193	G'd Rapids	29	"	----	"	2	--	Clerk	day	10	no	1 00	"		313	none
194	"	18	"	----	s	--	--	"	wk.	8¼	yes	1 08	6	Sickness	332	50
195	"	21	"	----	"	--	--	"	"	10	no	1 17	none		366	none
196	"	23	Hol.	16	"	--	--	"	day	10	"	1 35	26	Sickness	387	35
197	Detroit	20	Am.	----	"	--	--	"	"	10	"	1 50	none		470	40
198	"	23	"	----	m	2	1	"	"	10	----	1 50	"		470	50
199	"	41	"	----	"	2	4	"	wk.	10	no	1 50	"		470	none
200	Bay City	18	"	----	s	--	--	"	day	10	"	1 00	6	Sickness	307	"
201	Marshall	17	"	----	"	--	--	"	"	8	yes	1 00	none		313	150
202	Ionia	29	"	----	m	2	1	"	mo.	10	"	2 50	"		783	200
203	G'd Rapids	16	"	----	s	--	--	"	wk	9½	no	75	"		235	none
204	Jackson	32	"	----	m	2	1	Time keeper	day	10	yes	2 00	"		626	200
205	Lansing	27	"	----	"	2	--	"	"	10	no	1 50	13	Other work	450	75
206	Detroit	20	"	----	s	--	--	"	"	9	"	83	182	Lack of work	109	none
207	G'd Rapids	17	Ger.	16	"	--	--	"	"	10	"	75	none		235	"
208	Flint	23	Scot.	----	"	--	--	Office work	wk.	10	yes	3 25	"		1,017	400
209	"	21	------	----	m	2	1	"	----	8	"	1 00	14	Vacation	299	------
210	"	21	Am.	----	s	--	--	"	wk.	10	"	1 16	none		363	none
211	"	26	"	----	"	--	--	"	"	9	no	1 34	"		419	"
212	Pontiac	30	"	----	"	--	--	"	"	10	yes	3 31	"		1,036	150
213	"	21	"	----	"	--	--	"	"	----	no	1 00	6	Pleasure*	307	50
214	Three Rivers	42	"	----	m	2	3	"	"	10	"	3 00	none		939	------
215	"	26	"	----	s	--	--	"	mo.	10	"	2 50	"		783	100
216	Jackson	28	"	----	m	2	1	"	yr.	17	yes	3 83	"		1,200	400
217	Kalamazoo	30	"	----	"	2	--	"	day	10	----	3 00	"		939	400
218	"	23	"	----	s	--	--	"	"	10	----	2 00	"		626	100
219	"	35	Ger.	25	m	2	4	"	"	10	no	2 50	"		783	325
220	"	20	Am.	----	s	--	--	"	"	10	----	1 50	"		370	none
221	"	28	"	----	m	2	2	"	"	10	----	1 50	"		470	100
222	"	20	"	----	s	--	--	"	"	10	----	2 00	"		626	225
223	"	21	"	----	"	--	--	"	"	10	----	1 50	"		470	100
224	Battle Creek	25	Eng.	15	"	--	--	"	yr.	10	no	2 55	"		798	300
225	"	36	Am.	----	m	2	2	"	mo.	10	yes	1 51	"	Lack of work	470	none
226	Owosso	25	Can.	14	s	--	--	"	"	10	"	2 50	"		783	300
227	"	35	"	14	w	1	2	"	wk.	9	----	1 00	"		313	------
228	Marshall	53	Am.	----	m	7	1	"	day	10	yes	2 00	10	Other business	606	none
229	Bay City	19	Can.	11	s	--	--	"	mo.	11	"	1 75	30	Vacation	495	160
230	Detroit	19	Am.	----	"	--	--	"	day	10	no	1 00	156	In school	157	none
231	"	26	"	----	m	2	1	"	mo.	10	"	1 92	none		600	------
232	Pontiac	20	"	----	s	--	--	Shipper	day	10	"	1 25	48	Sickness	331	100
233	"	27	Can.	16	m	2	--	"	"	10	"	1 25	72	Lack of work	301	50
234	"	39	Am.	----	"	2	--	"	"	10	"	1 85	12	Sickness	557	none
235	"	42	"	----	"	2	1	"	"	10	"	1 25	24	"	361	------

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
dem.									yes		None					yes	yes	186
mo.									no	no	"					"	no	187
"	no							$25 00			"					"	"	188
wk.	yes	no	cont.	$1,600	7	yes	yes				"					"	yes	189
"	"	yes					"		yes	yes	"					"	"	190
"	"	no	mort.	200	6	yes	"		"	"	"					"	no	191
mo.	"	yes					"				"					"	yes	192
wk.	no							6 00			"							193
s-mo.									no	no	"					yes	yes	194
"									"	"	"					"	"	195
wk.									"	"	"					"	"	196
"									"		"					no	no	197
"	no							7 00			"					yes	yes	198
"	"							8 00	no	no	"					"	"	199
"									"	"	"					"	"	200
s-mo.											"					"	"	201
	no							8 00	no	no	"					"	no	202
s-mo.									"	"	"					"	yes	203
wk.	yes	no	mort.	350	7	yes	yes		yes	"	"					"	"	204
"	no							8 00	"		"					"	"	205
"											"					"		206
s-mo.											"					"	yes	207
wk.									yes	yes	"					"	no	208
"	no							8 00	"	no	"					"	"	209
"									no	"	"					"	"	210
"									"	"	"					"	"	211
"	yes	no	mort.	700	7	yes	yes		yes	"	"					"	"	212
"									"	"	"					"	"	213
"	yes	no	cont.	1,200	4	yes	yes		"	"	"					"	"	214
"									"	"	"					"	yes	215
dem.	yes	no			6	yes	yes		"	yes	"					"	no	216
mo.	no							8 00			"					"	yes	217
wk.									no		"					"	"	218
"	no							10 00			"					no	no	219
"											"					yes	yes	220
"	yes	yes					yes				"					"	"	221
mo.											"					"	"	222
"									yes		"					"	"	223
3 mo.									no	no	"					"	no	224
wk.	no							10 00	yes	"	"					"	"	225
mo.									"	"	"					"	yes	226
wk.									"		"					"	"	227
"	no								"	no	"					"	no	228
mo.									no		"					"	"	229
wk.											"					"		230
2 mo.	no							16 00	yes	no	J. O. U. A. M.	yes	yes	no	yes	"	no	231
wk.											None					"	yes	232
"	no										"					"	"	233
"	"										"					"	"	234
"	yes	yes									"					"	"	235

Book No. 6. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' lost time in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
251	Pontiac	24	Am.	----	s	--	--	Shipper	day	10	no	$1 25	30	Lack of work	$254	none
252	"	25	"	----	"	--	--	"	"	10	"	1 25	90	" "	279	"
253	"	32	"	----	m	2	1	"	"	10	"	1 00	40	" "	273	"
254	Jackson	28	"	----	"	2	1	"	"	10	"	1 66	10	" "	503	$100
255	"	30	"	----	"	2	1	"	"	10	"	2 00	none	----	626	150
256	"	26	"	----	s	--	--	"	"	10	"	1 50	90	Lack of work	335	none
257	"	24	"	----	m	2	--	"	"	10	yes	1 50	90	" "	335	"
258	"	28	"	----	"	2	--	"	"	10	no	1 50	15	" "	447	"
259	"	38	"	----	"	2	--	"	"	10	"	1 25	none	----	391	"
260	"	25	"	----	s	--	--	"	"	10	"	1 40	130	Lack of work	256	"
261	"	23	Ger.	12	"	--	--	"	"	10	"	1 25	90	" "	279	"
262	"	20	Am.	--	"	--	--	"	"	10	"	1 25	60	" "	316	"
263	"	47	Irish.	40	"			"	"	10	"	1 25	100	" "	266	"
264	"	33	Eng.	25	m	2		"	wk.	10	yes	2 00	100	Sickness	426	"
265	Lansing	43	Am.	----	"	2	1	"	day	10	no	1 10	100	Lack of work	234	"
266	"	35	Ger.	13	"	2	7	"	"	10	"	1 25	30	" "	354	"
267	"	53	Am.	----	"	2	--	"	"	10	"	1 25	30	" "	354	"
268	"	48	"	--	s	2	--	"	"	10	"	1 50	23	" "	435	"
269	"	18	"	----	"			"	"	10	"	1 10	13	Sickness	330	"
270	"	18	"	----	"		--	"	"	10	yes	1 00	4	"	309	"
271	"	24	"	----	m	2	--	"	"	10	no	1 00	25	Lack of work	288	"
272	"	23	"	----	s	--	--	"	"	10	"	1 50	12	Pleasure	451	50
273	"	41	Ger.	20	m	2	4	"	"	10	"	1 00	90	Lack of work	223	none
274	"	42	Am.	--	"	2	2	"	"	10	"	1 00	200	" "	113	"
275	"	29	"	--	"	2	3	"	"	10	"	1 00	30	" "	283	"
267	"	21	"	----	s	--	--	"	"	10	"	1 00	40	" "	273	"
277	G'd Rapids	34	Hol.	15	m	2	3	"	"	10	"	1 60	none	----	500	"
278	"	35	Am.	----	"	2	2	"	"	10	"	1 75	"	----	548	"
279	"	42	"	----	"	2	2	"	"	10	"	1 75	"	----	548	"
280	"	21	"	--	s	--	--	"	wk.	10	"	83	52	Lack of work	217	"
281	"	18	"	----	"	--	--	"	"	10	"	83	36	" " *	230	50
282	"	20	"	----	"	--		"	"	10	yes	1 65	6	Pleasure	507	50
283	"	29	"	----	m	2	2	"	day	10	no	2 25	none	----	704	none
284	"	23	"	----	"	2	2	"	"	10	yes	1 50	104	Lack of work	316	"
285	"	43	Hol.	25	"	2	2	"	"	10	no	2 00	6	Pleasure	614	75
286	Kalamazoo	22	Am.	----	s		--	"	"	10	"	1 50	none	----	470	10
287	"	25	"	----	"			"	"	10	"	2 00	"	----	626	100
288	"	6	"	----	m	2	2	"	"	10	"	1 25	"	----	391	none
289	"	24	"	----	"	2	3	"	"	10	"	1 50	150	Lack of work*	245	"
290	"	27	"	----	s	--	--	"	"	10	yes	1 75	60	" "	442	60
291	Ovid	29	"	----	m	2	--	"	"	10	no	1 50	78	" "	353	none
292	"	31	"	----	"	2	--	"	"	10	"	1 50	90	" "	335	"
293	"	36	"	----	"	2	1	"	"	10	"	1 50	90	" "	335	"
294	"	25	"	----	s			"	"	10	"	1 25	150	Other work	204	"
295	"	21	"	----	m	2	--	"	"	10	"	1 25	182	" "	163	"
296	Three Rivers	34	"	----	"	2	3	"	yr.	10	yes	3 20	none	----	1,000	150
297	" "	31	"	----	"	2	--	"	hr.	10	"	1 25	30	Lack of work	354	none
298	" "	48	"	----	"	2	1	"	day	10	"	1 75	none	----	548	------
299	" "	40	"	----	"	2	2	"	"	10	"	1 12	"	----	352	none
300	Flint	42	"	----	"	2	1	"	"	10	"	1 75	6	Holidays	537	------

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.									no	no	None					no	no	251
"									"	"	"					"	"	252
"	yes	no	mort.		6	yes	yes		yes	"	"					"	"	253
"	no							$5 00	no		"					yes	yes	254
"	yes	no	mort.	$600	6	yes	yes		yes	no	"					"	"	255
"	no							3 00	no		"					"	no	256
"	"							8 00	"		"					"	"	257
s-mo.	"							8 00	"		"					"	yes	258
"	"							8 00			"					"	"	259
"									no		"					"	"	260
"									yes		"					"	"	261
"									"		"					"	"	262
"									no		"					"	"	263
"	no							8 00			"					no	"	264
"	yes	no	mort.		7	yes	yes		no	no	"					yes	no	265
"	"	yes					"		"	"	"					no	"	266
"	"	"					"		"	"	"					yes	yes	267
"	"	no	mort.	350	7	no	"		"	"	"					"	"	268
wk.										"	"					"	"	269
"									no	"	"					"	"	270
"	no							4 00		"	"					"	"	271
"									yes	yes	"					"	"	272
"	yes	yes					yes		"	no	"					"	"	273
"	no							6 00	no	"	"					"	"	274
"	"							7 00	yes	"	"					"	"	275
"									no	"	"					"	"	276
"	yes	no	mort.	200	7	yes	yes		"	"	"					"	"	277
"	no							7 50	yes	"	"					"	"	278
"	"							10 00	no	"	"					"	no	279
"									"	"	"					"	yes	280
"									yes	"	"					"	"	281
s-mo.									no	"	"					"	"	282
wk.	no							12 00	"	"	"					"	"	283
"	"							5 00	"	"	"					"	"	284
"	yes	yes					yes		"	"	"					"	"	285
"									"		"					"	"	286
mo.											"					"	"	287
"	yes	no	cont.	300	7	yes	no				"					"	"	288
s-mo.	no							6 00			"					no	no	289
wk.											"					yes	yes	290
s-mo.	no							4 00	no	no	"					"	"	291
"	"							4 00	yes		"					"	"	292
"	"							5 00	"		"					"	"	293
"									"	no	"					"	"	294
"	yes	yes							"	"	"					"	"	295
wk.	"	no	mort.	500	6	yes	yes		"	"	"					"	no	296
"	no							5 00	no		"					"	"	297
"	"								yes		"					"	yes	298
"	yes	yes					yes		"	no	"						"	299
s-mo.	"	"					"		no	yes	"					yes	no	300

Books Nos. 7 and 8. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work.	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
321	Flint	26	Am.	----	m	2	..	Stock-keeper	day	10	no	\$1 50	12	Lack of work	\$452	\$200
322	"	30	"	----	"	2	2	"	wk.	10	"	1 25	none	----------	391	none
323	"	52	Ger.	30	"	2	..	"	day	10	"	1 12	30	Lack of work*	318	"
324	"	43	"	14	"	2	2	"	"	10	yes	1 12	30	" "	318	"
325	"	45	Fr.	25	s	--	--	"	"	10	"	1 75	3	Holidays	542	100
326	"	37	Ger.	20	m	2	5	"	"	10	"	1 50	30	Vacation*	425	none
327	"	29	Am.	---	"	2	..	"	"	10	no	2 00	25	Sickness	576	------
328	Jackson	59	"	----	"	2	1	"	"	10	"	1 50	10	----------	454	------
329	"	49	"	----	"	2	--	"	"	10	"	1 25	26	----------	359	none
330	"	24	"	----	s	--	--	"	wk.	10	yes	2 08	none	----------	650	150
331	"	43	"	----	m	3	2	"	day	10	"	1 50	150	Lack of work	245	------
332	"	23	Ger.	----	s	--	--	"	wk.	10	no	2 00	none	----------	626	200
333	Pontiac	25	Am.	----	m	2	..	"	"	10	----	1 25	"	----------	391	none
334	"	..	"	----	"	2	1	"	day	10	no	1 25	96	Lack of work	271	------
335	"	37	Can.	32	"	4	--	"	"	10	"	1 25	78	" "	294	none
336	"	35	Am.	----	"	2	..	"	"	10	"	1 35	1	Sickness	421	50
337	"	36	"	----	w	1	2	"	"	10	"	1 37	none	----------	429	none
338	Three Rivers	44	"	----	m	2	--	"	"	9	"	1 02	20	Sickness	299	"
339	G'd Rapids	19	"	----	s	--	--	"	"	10	yes	1 00	none	----------	313	"
340	Marshall	21	"	----	"	--	--	"	"	10	"	75	"	----------	235	------
341	G'd Rapids	26	"	----	"	--	--	"	wk.	10	"	1 33	"	----------	416	none
342	Jackson	28	"	----	"	--	--	Inspector	day	10	"	1 25	20	Sickness	366	"
343	"	20	"	----	"	--	--	"	"	10	"	1 35	78	Lack of work	317	"
344	"	33	"	----	m	2	2	"	"	10	"	1 75	10	" "	530	"
345	"	30	"	----	"	2	2	"	"	10	"	1 60	60	" " †	405	10
346	"	37	Can	24	w	1	2	"	"	10	"	1 65	60	" " †	417	none
347	Lansing	46	Am.	----	m	2	5	"	"	10	no	1 25	60	" "	316	"
348	"	53	"	----	"	2	1	"	mo.	10	----	2 00	none	----------	626	200
349	Ionia	51	Eng.	29	"	3	..	Lumber scaler	"	10	----	1 75	"	Sickness	548	none
350	Pontiac	48	Ger.	30	"	2	5	" "	day	10	no	1 50	"	----------	470	100
351	Jackson	50	Can.	46	"	5	4	" "	"	10	"	1 50	"	----------	470	none
352	Three Rivers	33	Am.	----	w	2	2	Draughtsman	"	10	yes	3 18	15	Vacation	948	"
353	" "	20	"	----	s	--	--	"	"	10	"	1 36	20	"	399	"
354	" "	24	"	----	m	2	..	"	"	10	no	1 50	12	Lack of work	452	50
355	Kalamazoo	39	"	----	"	2	4	"	"	10	----	4 00	60	" "	1,012	300
356	G'd Rapids	23	"	----	s	--	--	"	"	10	no	2 00	none	----------	626	150
357	"	27	"	----	m	2	1	Designer	"	10	"	2 50	"	----------	783	300
358	"	28	"	----	"	2	2	"	"	10	"	3 30	6	Pleasure	1,013	300
359	Flint	24	"	----	s	--	--	Engineer	"	10	yes	1 50	120	Lack of work	290	none
360	"	33	"	----	m	2	--	"	"	10	"	1 33	none	----------	416	100
361	"	52	Ger.	47	"	2	5	"	"	10	"	2 00	10	Sickness	606	none
362	"	56	Scot.	----	s	--	--	"	wk.	10	"	2 00	none	----------	626	"
363	"	37	Am.	----	m	2	..	"	day	11	no	1 78	52	Lack of work	365	"
364	"	33	"	----	"	2	2	"	"	10	yes	1 37	4	Laid off	433	75
365	"	42	Ger.	30	"	2	3	"	"	10	"	1 50	12	Sickness	452	none
366	"	37	Am.	----	"	2	2	"	wk.	10	"	1 33	30	"	376	"
367	Lansing	27	"	----	"	2	1	"	day	10	no	1 66	13	Lack of work	498	40
368	"	43	"	----	"	3	5	"	"	10	yes	2 25	9	Sickness	684	75
369	"	27	"	----	"	2	..	"	"	10	no	1 75	40	"	478	none
370	Kalamazoo	35	"	----	"	2	1	"	"	12	"	1 50	none	----------	470	"

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* And sickness.
† And holidays.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	no	----	------	------	----	----	----	$7 50	no	no	None	----	----	----	----	yes	yes	321
"	"	----	------	------	----	----	----	5 00	"	yes	"	----	----	----	----	"	"	322
s-mo.	yes	yes	------	------	----	----	yes	------	yes	no	"	----	----	----	----	no	"	323
"	"	"	------	------	----	----	"	------	"	"	"	----	----	----	----	yes	"	324
"	----	----	------	------	----	----	----	------	"	yes	"	----	----	----	----	----	----	325
"	yes	no	mort.	$450	7	yes	yes	------	"	"	"	----	----	----	----	yes	no	326
wk.	"	"	"	1,100	5	"	"	------	"	no	"	----	----	----	----	"	"	327
s-mo.	no	----	------	------	----	----	----	10 00	"	----	"	----	----	----	----	"	yes	328
"	----	----	------	------	----	----	----	------	"	no	"	----	----	----	----	"	"	329
wk.	----	----	------	------	----	----	----	------	no	"	"	----	----	----	----	"	"	330
"	yes	yes	------	------	----	----	yes	------	----	----	"	----	----	----	----	"	no	331
"	----	----	------	------	----	----	----	------	no	no	"	----	----	----	----	"	"	332
"	no	----	------	------	----	----	----	------	----	----	"	----	----	----	----	"	"	333
"	yes	yes	------	------	----	----	yes	------	yes	no	"	----	----	----	----	"	yes	334
"	"	no	cont.	175	7	no	no	------	no	"	"	----	----	----	----	no	no	335
"	no	----	------	------	----	----	----	7 00	"	"	"	----	----	----	----	yes	yes	336
"	"	----	------	------	----	----	----	------	"	"	"	----	----	----	----	"	"	337
"	yes	yes	------	------	----	----	no	------	"	"	"	----	----	----	----	"	no	338
s-mo.	----	----	------	------	----	----	----	------	"	"	"	----	----	----	----	"	"	339
2 mo.	----	----	------	------	----	----	----	------	----	----	"	----	----	----	----	"	"	340
wk.	----	----	------	------	----	----	----	------	no	no	"	----	----	----	----	"	yes	341
"	----	----	------	------	----	----	----	------	"	"	"	----	----	----	----	"	"	342
"	----	----	------	------	----	----	----	------	"	"	"	----	----	----	----	"	no	343
"	yes	no	mort.	50	7	yes	yes	------	yes	"	"	----	----	----	----	"	"	344
"	no	----	------	------	----	----	----	8 00	"	"	"	----	----	----	----	"	yes	345
"	"	----	------	------	----	----	----	5 00	no	"	"	----	----	----	----	"	no	346
s-mo.	"	----	------	------	----	----	----	7 00	yes	"	"	----	----	----	----	"	yes	347
mo.	yes	no	------	------	----	----	yes	------	no	"	"	----	----	----	----	"	no	348
"	no	----	------	------	----	----	----	9 00	yes	"	"	----	----	----	----	"	"	349
wk.	"	----	------	------	----	----	----	6 25	"	yes	"	----	----	----	----	"	"	350
"	yes	no	cont.	580	6	no	yes	------	no	no	"	----	----	----	----	"	yes	351
"	no	----	------	------	----	----	----	10 00	yes	yes	"	----	----	----	----	"	"	352
"	----	----	------	------	----	----	----	------	----	----	"	----	----	----	----	"	"	353
"	no	----	------	------	----	----	----	------	no	----	"	----	----	----	----	"	"	354
mo.	"	----	------	------	----	----	----	------	----	----	"	----	----	----	----	"	"	355
wk.	----	----	------	------	----	----	----	------	no	no	"	----	----	----	----	no	no	356
"	no	----	------	------	----	----	----	6 00	"	"	"	----	----	----	----	yes	yes	357
"	"	----	------	------	----	----	----	12 50	yes	yes	"	----	----	----	----	"	"	358
"	----	----	------	------	----	----	----	------	"	no	"	----	----	----	----	"	"	359
"	no	----	------	------	----	----	----	6 00	no	"	"	----	----	----	----	"	"	360
"	yes	yes	------	------	----	----	yes	------	"	"	"	----	----	----	----	"	"	361
"	"	"	------	------	----	----	"	------	yes	yes	"	----	----	----	----	"	"	362
"	no	----	------	------	----	----	----	6 00	no	no	"	----	----	----	----	"	no	363
s-mo.	yes	yes	------	------	----	----	yes	------	"	"	"	----	----	----	----	"	yes	364
"	no	----	------	------	----	----	----	8 00	"	"	"	----	----	----	----	"	"	365
wk.	yes	no	cont.	650	7	yes	yes	------	----	yes	"	----	----	----	----	"	"	366
s-mo.	no	----	------	------	----	----	----	7 00	yes	"	"	----	----	----	----	"	"	367
wk.	yes	yes	------	------	----	----	yes	------	"	"	"	----	----	----	----	"	no	368
s-mo	no	----	------	------	----	----	----	5 00	no	no	"	----	----	----	----	"	yes	369
"	"	----	------	------	----	----	----	6 00	----	----	"	----	----	----	----	"	"	370

Book No. 9. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
401	Lowell	52	Am.	----	m	2	2	Engineer	day	10	no	$1 80	42	Lack of work	$497	none
402	Ovid	42	"	----	"	2	4	"	"	10	"	2 00	none	----	626	"
403	Mt. Clemens	30	Hol.	----	"	2	1	"	"	10	"	1 67	6	Holidays	512	$250
404	Jonesville	38	Am.	----	"	2	2	"	"	10	yes	1 75	15	Sickness	522	50
405	Saginaw	32	Ger.	29	"	2	5	"	"	10½	"	1 50	5	----	462	none
406	Albion	39	Am.	----	"	2	1	"	"	10	"	2 00	12	----	602	100
407	Three Rivers	31	"	----	"	2	--	"	"	12	no	2 00	none	----	730	none
408	Battle Creek	41	"	----	"	2	6	"	"	10	yes	1 22	4	Laid off*	386	"
409	Rochester	30	"	----	s	--	--	"	"	10	"	1 50	none	----	469	75
410	Wayne	32	Eng.	12	m	2	3	"	"	12	"	2 00	"	----	650	none
411	Owosso	42	Am.	----	"	2	1	"	wk.	10	"	1 33	"	----	416	"
412	G'd Rapids	18	Ger.	3	s	--	--	Fireman	"	10	"	66	"	----	208	"
413	"	42	Pol.	15	m	2	4	"	day	10	no	1 50	78	Lack of work	353	"
414	"	20	Am.	----	s	--	--	"	wk.	10	"	66	104	" "	139	"
415	"	52	Dane	16	m	2	2	"	day	16	yes	1 00	182	" " *	142	"
416	Jackson	35	Irish	23	s	--	--	"	"	10	no	1 50	90	Sickness	335	"
417	"	31	Ger.	6	m	2	--	"	wk.	10	"	1 25	none	----	891	75
418	"	42	Am.	----	"	2	4	"	day	10	"	1 50	"	----	470	none
419	Three Rivers	36	"	----	"	2	2	"	"	12	"	1 50	"	----	548	"
420	" "	35	"	----	"	2	1	"	wk.	12	----	1 50	"	----	548	"
421	Ionia	23	"	----	s	--	--	"	day	10	yes	1 10	60	Laid off.*	278	----
422	Saginaw	23	Ger.	----	--	--	--	"	"	10	"	1 00	none	----	813	100
423	Detroit	37	"	10	m	2	2	Woodworker	wk.	10	no	1 50	"	----	470	150
424	"	50	Am.	----	"	2	3	"	"	10	"	1 75	"	----	548	100
425	"	48	Ger.	21	"	2	1	"	day	10	"	1 25	90	Lack of work	279	none
426	"	50	"	25	"	2	5	"	"	10	"	1 50	12	" "	450	200
427	"	37	Am.	----	"	2	1	"	"	10	"	1 25	30	" "	354	none
428	"	28	"	----	"	2	2	"	wk.	10	"	2 00	6	Holidays	614	200
429	"	28	"	----	"	2	--	"	pc.	10	"	1 75	60	Lack of work	443	75
430	"	29	"	----	s	--	--	"	day	10	"	1 50	60	" "	380	50
431	"	26	"	----	m	2	1	"	pc.	10	"	1 75	60	" "	443	none
432	"	28	"	----	"	2	--	"	"	10	"	1 50	30	" "	425	"
433	"	39	Ger.	12	"	2	3	"	day	10	----	2 25	none	----	704	200
434	"	27	Can.	6	s	--	--	"	"	10	----	1 75	"	----	547	----
435	"	27	"	7	"	--	--	"	"	10	----	2 00	"	----	626	200
436	"	43	Ger.	25	"	--	--	"	"	10	no	1 75	4	----	541	50
437	"	28	"	10	m	2	1	"	"	10	"	1 50	40	Lack of work	410	none
438	"	22	Fr.	13	s	--	--	"	wk.	10	"	1 25	10	Sickness	379	55
439	"	58	Can.	33	m	4	3	"	day	10	"	1 50	65	Lack of work	372	----
440	"	30	Ger.	10	"	2	3	"	"	10	"	2 00	none	----	626	----
441	"	38	Am.	----	"	2	3	"	"	10	"	2 50	5	Holidays	770	200
442	"	49	"	----	"	3	--	"	"	10	"	2 00	6	Vacation	614	----
443	"	50	Ger.	15	"	3	3	"	"	10	"	2 00	none	----	626	200
444	"	72	Am.	----	"	3	--	"	"	10	"	1 50	160	Vacation*	290	none
445	"	51	Ger.	13	"	2	5	"	wk.	10	"	1 70	none	----	582	"
446	"	35	Am.	----	"	2	3	"	"	10	"	2 00	"	----	626	150
447	"	22	"	----	s	--	--	"	"	10	"	1 50	30	Pleasure	425	150
448	"	37	"	----	m	2	2	"	day	10	"	2 25	8	"	688	none
449	"	40	Eng.	5	"	2	1	"	"	10	"	1 50	60	Lack of work	380	"
450	"	36	"	17	"	2	--	"	pc.	10	"	1 57	10	" " *	476	"

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
mo.	yes	no	mort.	$300	7	yes	yes	----	yes	yes	None	----	----	----	----	yes	yes	401
s-mo.	no	----	----	----	----	----	----	$5 00	no	no	"	----	----	----	----	"	"	402
wk.	yes	yes	----	----	----	----	yes	----	"	"	†	----	----	----	----	"	no	403
s-mo.	"	"	----	----	----	----	"	----	yes	"	None	----	----	----	----	"	yes	404
"	"	no	cont.	50	7	yes	no	----	----	----	"	----	----	----	----	no	no	405
wk.	"	"	mort.	500	7	"	----	----	yes	no	"	----	----	----	----	yes	yes	406
"	"	"	"	500	7	"	yes	----	"	"	"	----	----	----	----	"	"	407
"	"	"	"	450	8	"	"	----	"	yes	"	----	----	----	----	"	"	408
"	no	----	----	----	----	----	----	7 00	----	----	"	----	----	----	----	"	"	409
s-mo.	"	----	----	----	----	----	----	5 00	yes	no	"	----	----	----	----	"	no	410
wk.	yes	yes	----	----	----	----	yes	----	"	yes	Nat. Ass'n St. Eng'r.	yes	yes	----	----	"	yes	411
"	----	----	----	----	----	----	----	----	no	no	None	----	----	----	----	"	no	412
"	no	----	----	----	----	----	----	6 00	yes	"	"	----	----	----	----	"	yes	413
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	414
"	yes	no	mort.	400	7	yes	yes	----	yes	"	"	----	----	----	----	"	"	415
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	no	416
"	no	----	----	----	----	----	----	6 00	yes	"	"	----	----	----	----	no	"	417
"	"	----	----	----	----	----	----	8 00	no	"	Nat. Ass'n St. Eng'r.	no	no	----	yes	yes	yes	418
"	"	----	----	----	----	----	----	5 00	yes	"	None	----	----	----	----	"	"	419
"	"	----	----	----	----	----	----	6 50	"	"	"	----	----	----	----	"	no	420
s-mo.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	421
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	----	----	422
"	yes	yes	----	----	----	----	yes	----	no	no	"	----	----	----	----	yes	yes	423
"	"	"	----	----	----	----	----	----	yes	yes	"	----	----	----	----	"	"	424
wk.	"	no	mort.	600	7	----	yes	----	"	----	"	----	----	----	----	no	no	425
"	"	yes	----	----	----	----	"	----	"	no	"	----	----	----	----	"	"	426
"	no	----	----	----	----	----	----	8 00	----	----	"	----	----	----	----	"	"	427
"	yes	yes	----	----	----	----	yes	----	----	----	"	----	----	----	----	yes	"	428
s-mo.	no	----	----	----	----	----	----	9 00	yes	no	"	----	----	----	----	"	yes	429
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	430
"	no	----	----	----	----	----	----	8 00	----	----	"	----	----	----	----	"	"	431
"	"	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	432
wk.	yes	yes	----	----	----	----	yes	----	----	----	"	----	----	----	----	"	"	433
"	----	----	----	----	----	----	----	----	yes	----	"	----	----	----	----	"	"	434
"	----	----	----	----	----	----	----	----	"	----	"	----	----	----	----	"	"	435
"	yes	no	cont.	400	7	----	----	----	----	----	"	----	----	----	----	"	"	436
"	no	----	----	----	----	----	----	7 00	no	----	"	----	----	----	----	----	----	437
"	----	----	----	----	----	----	----	----	yes	----	"	----	----	----	----	----	----	438
"	no	----	----	----	----	----	----	16 00	"	yes	"	----	----	----	----	yes	yes	439
"	yes	no	mort.	----	7	----	yes	----	----	----	"	----	----	----	----	"	"	440
"	"	yes	----	----	----	----	"	----	yes	yes	"	----	----	----	----	"	"	441
"	no	----	----	----	----	----	----	16 00	"	no	"	----	----	----	----	"	no	442
"	yes	no	cont.	400	7	yes	yes	----	"	"	"	----	----	----	----	no	"	443
"	"	yes	----	----	----	----	no	----	"	"	"	----	----	----	----	"	"	444
"	no	----	----	----	----	----	----	9 00	"	----	Swiss Society	yes	yes	no	no	yes	yes	445
"	yes	no	cont.	200	7	yes	yes	----	no	no	None	----	----	----	----	"	"	446
"	----	----	----	----	----	----	----	----	yes	"	"	----	----	----	----	"	no	447
"	no	----	----	----	----	----	----	9 00	"	yes	"	----	----	----	----	"	yes	448
"	"	----	----	----	----	----	----	9 50	"	no	"	----	----	----	----	"	"	449
"	"	----	----	----	----	----	----	8 00	"	"	"	----	----	----	----	"	"	450

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† Donaldson Bros. Bros. Employés' Sick and Accidental Benefit Association.

Book No. 10.

Table No. 1.—Continued.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
451	Detroit-----	39	Scot.	15	m	2	1	Woodworker	day	10	no	$1 85	12	Sickness -----	$557	$100
452	" -----	30	Can.	8	"	2	1	"	"	10	"	1 60	30	" -----	453	50
453	" -----	28	Am.	----	"	2	--	"	pc.	10	"	1 50	20	Lack of work	440	none
454	" -----	45	Scot.	20	"	2	4	"	"	10	"	1 20	15	" "	358	"
455	" -----	44	Fr.	25	"	2	--	"	"	10	"	1 50	60	" " *	380	"
456	" -----	18	Ger.	15	s	--	--	"	day	10	"	1 00	none	----------	313	50
457	" -----	42	"	----	m	2	--	"	"	10	"	1 50	"	----------	470	none
458	" -----	36	Fr.	----	"	2	--	"	"	10	yes	1 50	10	Sickness -----	455	----
459	" -----	18	Can.	1	s	--	--	"	pc.	10	"	1 25	none	----------	391	50
460	" -----	35	"	10	m	2	1	"	day	10	"	2 00	"	----------	626	25
461	" -----	16	Ger.	5	s	--	--	"	"	10	"	50	"	----------	157	none
462	" -----	22	Am.	----	"	--	--	"	pc.	10	"	1 50	"	----------	470	"
463	" -----	18	Can.	----	"	--	--	"	"	10	"	1 00	150	Lack of work	163	"
464	" -----	19	"	4	"	--	--	"	"	10	"	1 00	30	" "	283	125
465	" -----	20	Am.	----	"	--	--	"	"	10	"	1 00	60	" "	253	none
466	" -----	47	Can.	12	m	2	5	"	"	10	"	2 50	none	----------	783	"
467	" -----	32	Am.	----	s	3	--	"	"	10	no	1 75	"	----------	548	"
468	" -----	28	Can.	8	"	--	--	"	"	10	yes	2 00	3	Pleasure -----	620	50
469	" -----	34	Am.	----	m	2	2	"	day	10	"	2 50	none	----------	783	none
470	" -----	38	"	----	"	2	--	"	"	10	no	2 50	"	----------	783	300
471	" -----	39	Ger.	12	"	2	3	"	"	10	"	2 22	12	Sickness -----	668	200
472	" -----	48	"	13	"	2	6	"	"	10	"	2 25	none	----------	675	200
473	" -----	46	"	24	"	2	9	"	"	10	----	1 50	30	Lack of work	425	----
474	" -----	27	Am.	----	"	2	--	"	"	10	no	2 25	none	----------	704	300
475	" -----	38	Ger.	12	"	2	5	"	"	10	"	2 25	"	----------	704	225
476	" -----	39	"	31	"	2	--	"	"	10	"	2 00	"	----------	626	none
477	" -----	47	Am.	----	"	4	4	"	"	10	"	2 00	"	----------	626	"
478	Kalamazoo.	36	"	----	"	--	--	"	pc.	10	"	2 00	150	Lack of work	326	"
479	"	36	"	----	s	--	--	"	"	10	"	2 00	50	" "	526	25
480	"	55	"	----	m	2	2	"	"	10	----	1 50	none	----------	470	none
481	"	45	"	----	"	2	2	"	day	10	no	1 25	"	----------	391	"
482	"	38	"	----	"	2	4	"	"	10	----	1 50	"	----------	470	"
483	"	35	"	----	"	2	--	"	"	10	no	1 75	"	----------	548	75
484	"	30	"	----	s	--	--	"	pc.	10	----	1 50	60	Lack of work	380	none
485	"	25	"	----	"	--	--	"	"	10	no	2 00	60	" "	506	130
486	"	39	Can.	15	m	2	1	"	"	10	"	2 00	40	Laid off -----	540	none
487	"	26	Am.	----	"	2	--	"	"	10	"	2 00	45	" -----	536	"
488	"	52	Irish	40	"	4	2	"	"	10	"	2 00	none	----------	626	"
489	"	43	Am.	----	"	2	--	"	"	10	"	2 00	90	Lack of work	446	"
490	"	38	Can.	14	s	--	--	"	day	10	"	2 00	30	Laid off -----	566	200
491	"	26	Am	----	"	--	--	"	pc.	10	----	1 25	150	Lack of work	204	none
492	"	30	Hol.	20	m	2	1	"	"	10	----	1 75	30	" "	495	150
493	"	40	Am.	----	"	2	3	"	"	10	no	1 50	90	" "	335	none
494	"	36	"	----	"	2	--	"	"	10	----	1 50	30	" "	430	"
495	"	22	Irish	18	s	--	--	"	"	10	----	1 00	30	" "	283	10
496	"	24	Am.	----	"	--	--	"	day	10	no	1 75	175	" "	241	none
497	"	42	Can.	----	m	2	2	"	pc.	10	"	2 00	30	" "	566	40
498	"	39	Am.	----	s	--	--	"	"	10	"	2 50	208	" "	156	none
499	"	42	Can.	2	m	2	2	"	day	10	----	2 50	60	" "	633	"
500	"	27	Am.	----	"	2	1	"	"	10	----	1 50	30	" "	425	50

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	yes	yes					yes		yes	no	None					yes	yes	451
"	"	no	cont.	$500	5	no	"		no	"	"					"	"	452
"	no							$8 00	yes	"	"					"	"	453
"	"							5 00	"	"	"					"	"	454
"	"							9 00	"	"	"					"	"	455
s-mo.											"					"	"	456
"	no							5 00			"					"	"	457
"	"										"					"	"	458
"											"					no	no	459
"	no							7 00	no	no	"					yes	yes	460
"									"	"	"					"	"	461
"											"					"	"	462
"											"					"	"	463
"									no	no	"					"	"	464
"											"					"	"	465
"	no							12 00	no	no	"					"	"	466
"	"							6 00	yes		"					"	"	467
"									no	no	"					"	"	468
"	yes	no	cont.	800	7	yes	yes				"					"	no	469
wk.	no							10 00	no	no	"					"	yes	470
"	yes	yes					yes		"	"	"					"	"	471
"	"	no	mort.	2,000	6	yes	"				"					"	no	472
"	no							11 00	yes		"					"	"	473
"	yes	yes					yes				"					"	"	474
"	"	no	mort.	225	7	yes	"				"					"	"	475
s-mo.	"	yes					"		yes		"					"	yes	476
"	no							7 00	"	no	"					"	"	477
"	"								"		"					"	"	478
"											C. & W. M. U.				yes	"	"	479
"	no							8 00	yes		None					no	no	480
"	yes	yes					no		"		"					yes	yes	481
"	no							8 00			"					"	"	482
"	yes	yes					yes		yes		"					"	"	483
wk.											"					"	"	484
"	yes	no	cont.	100	7	yes	no		yes		C. & W. M. U.	no	no	no	yes	"	"	485
mo.	"	yes					yes		no	no	None					"	"	486
"	no							12 50	"	"	"					"	"	487
"	"							9 00		"	"					"	"	488
"	"							8 00	no	yes	"					"	"	489
"									yes	no	"					"	"	490
wk.											"					"	"	491
"	yes	no	mort	200	7	yes	yes		yes		"					"	"	492
"	no							7 00			"					"	"	493
"	"							6 50			"					"	"	494
"											"					"	"	495
"											C. & W. M. U.	no	no	no	yes	"	"	496
"	no							6 00			None					"	"	497
"	"							6 00			"					"	"	498
"	"								yes		"					"	"	499
"	"							7 00			"					"	"	500

Book No. 11. **Table No. 1.—CONTINUED.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
501	Kalamazoo.	29	Hol.	16	m	2	2	Woodworker	pc.	10	no	$2 00	30	Lack of work	$566	none
502	"	26	Am.	----	"	2	--	"	day	10	----	1 50	60	" "	380	"
503	"	38	Can.	14	"	2	2	"	pc.	10	no	2 00	60	Laid off ------	506	"
504	"	26	Hol.	14	"	2	2	"	"	10	----	2 00	50	Lack of work	526	$100
505	"	37	Can.	14	"	2	1	"	"	10	----	3 00	60	" "	759	300
506	"	38	"	2	"	2	--	"	day	10	----	2 50	40	" "	683	150
507	"	18	Am.	----	s	--	--	"	"	10	no	75	60	" "	190	none
508	"	18	"	----	"	--	--	"	"	10	"	1 00	none	----------------	313	50
509	"	29	"	---	"	--	--	"	pc.	10	"	1 75	100	Lack of work	373	none
510	"	29	Can.	9	m	2	2	"	"	10	----	2 25	30	" "	637	100
511	"	35	"	1	"	2	2	"	"	10	----	2 25	40	" "	614	75
512	"	39	"	10	"	2	1	"	"	10	----	3 00	30	" "	849	200
513	"	45	"	16	"	2	1	"	"	10	----	2 50	30	" "	708	200
514	"	30	Am.	----	"	2	--	"	"	10	----	2 50	30	" "	708	100
515	"	45	Can.	18	"	2	1	"	"	10	----	2 25	40	" "	614	75
516	"	40	Am.	----	"	2	3	"	"	10	----	2 00	40	" "	546	100
517	"	37	Can.	16	s	--	--	"	"	10	----	2 25	30	" "	637	200
518	"	35	Hol.	15	m	2	2	"	"	10	----	2 00	40	" "	546	none
519	"	56	Am.	----	"	2	4	"	"	10	----	2 00	30	" "	566	150
520	"	21	Hol.	10	s	--	--	"	day	10	----	1 50	35	" "	417	100
521	"	27	"	20	m	2	2	"	"	10	----	1 50	90	" "	335	none
522	"	50	Am.	----	"	4	1	"	pc.	10	----	3 00	10	" "	909	500
523	"	20	"	----	s	--	--	"	day	10	----	1 50	30	" "	425	none
524	"	25	"	----	m	2	2	"	pc.	10	----	1 50	30	" "	425	100
525	"	25	"	----	"	2	1	"	day	10	----	1 75	40	" "	478	50
526	"	19	"	----	s	--	--	"	"	10	----	1 00	none	----------------	313	25
527	"	31	"	----	"	--	--	"	pc.	10	----	1 50	95	Lack of work	327	none
528	"	18	"	----	"	--	--	"	day	10	----	80	none	----------------	358	"
529	"	35	"	----	m	2	2	"	pc.	10	----	2 00	90	Lack of work	446	150
530	"	40	"	----	"	2	1	"	day	10	----	1 75	100	" "	373	none
531	"	32	"	----	"	2	1	"	"	10	----	1 75	90	" "	390	50
532	"	20	"	----	s	--	--	"	pc	10	----	2 00	125	" "	376	none
533	"	19	"	----	"	--	--	"	day	10	----	1 50	90	" "	335	"
534	"	42	"	----	m	2	3	"	pc.	10	----	2 00	100	" "	426	"
535	Jackson ----	41	"	----	"	2	3	"	day	10	yes	1 75	40	Laid off ------	525	------
536	" ----	30	Ger.	----	"	2	2	"	pc.	10	no	2 00	10	Sickness ------	606	150
537	" ----	56	"	----	"	4	--	"	day	10	"	1 75	none	----------------	548	150
538	" ----	39	Am.	----	"	2	4	"	pc.	10	"	1 75	"	----------------	548	none
539	" ----	27	Ger.	----	"	2	1	"	"	10	"	2 00	12	Sickness ------	602	"
540	" ----	40	Am.	----	"	3	1	"	day	10	"	2 50	3	----------------	775	------
541	" ----	44	"	----	"	2	2	"	"	10	yes	2 00	14	Vacation ------	598	none
542	" ----	38	"	----	"	2	2	"	pc.	10	"	2 00	10	Sickness ------	606	100
543	" ----	37	"	----	"	2	2	"	day	10	no	1 50	none	----------------	470	none
544	" ----	42	"	----	"	2	5	"	pc.	10	"	2 00	6	----------------	614	"
545	" ----	56	Can.	50	"	6	--	"	"	10	"	1 50	none	----------------	470	"
546	" ----	36	Eng.	15	"	2	2	"	"	10	"	2 00	3	Lack of work	620	"
547	" ----	32	Can.	10	s	--	--	"	"	10	"	1 50	10	----------------	455	"
548	" ----	20	Am.	----	"	--	--	"	day	10	"	2 00	10	Sickness ------	606	"
549	" ----	36	Fr.	----	"	--	--	"	pc.	10	"	2 00	none	----------------	626	50
550	" ----	27	Am.	----	"	--	--	"	"	10	"	1 75	30	Lack of work	495	100

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	no	----	----	----	----	----	----	$8 00	yes	----	C. & W. M. U.	----	----	----	yes	yes	yes	501
"	yes	no	mort.	$350	7	yes	yes	----	"	----	None	----	----	----	----	"	"	502
"	"	yes	----	----	----	----	"	----	"	no	"	----	----	----	----	"	"	503
"	no	----	----	----	----	----	----	8 00	----	----	"	----	----	----	----	no	no	504
"	yes	no	mort.	400	7	----	yes	----	yes	----	"	----	----	----	----	yes	yes	505
"	no	----	----	----	----	----	----	10 00	----	----	"	----	----	----	----	no	no	506
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	yes	yes	507
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	508
"	----	----	----	----	----	----	----	----	yes	----	"	----	----	----	----	"	"	509
mo.	no	----	----	----	----	----	----	9 00	----	----	"	----	----	----	----	no	no	510
"	"	----	----	----	----	----	----	7 50	----	----	"	----	----	----	----	yes	yes	511
"	"	----	----	----	----	----	----	8 00	yes	----	"	----	----	----	----	no	no	512
"	yes	yes	----	----	----	----	yes	----	"	----	"	----	----	----	----	"	"	513
"	no	----	----	----	----	----	----	8 50	----	----	"	----	----	----	----	yes	yes	514
"	"	----	----	----	----	----	----	7 00	----	----	"	----	----	----	----	no	no	515
"	"	----	----	----	----	----	----	6 50	----	----	"	----	----	----	----	yes	yes	516
"	----	----	----	----	----	----	----	----	yes	----	"	----	----	----	----	no	no	517
"	no	----	----	----	----	----	----	7 00	"	----	"	----	----	----	----	"	"	518
"	"	----	----	----	----	----	----	8 00	"	----	"	----	----	----	----	yes	yes	519
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	no	no	520
"	yes	yes	----	----	----	----	yes	----	---	----	"	----	----	----	----	"	"	521
"	"	"	----	----	--	----	"	----	----	----	C. & W. M. U.	----	----	----	yes	yes	yes	522
"	----	----	----	----	----	----	----	----	----	----	None	----	----	----	----	"	"	523
"	yes	no	mort	300	7	yes	yes	----	----	----	"	----	----	----	----	"	"	524
"	"	yes	----	----	----	----	"	----	----	----	"	----	----	----	----	"	"	525
wk.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	526
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	527
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	528
"	no	----	----	----	----	----	----	6 00	----	----	"	----	----	----	----	"	"	529
"	yes	yes	----	----	----	----	yes	----	----	----	"	----	----	----	----	"	"	530
"	"	"	----	----	----	----	"	----	yes	----	"	----	----	----	----	"	"	531
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	532
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	533
"	yes	yes	----	----	----	----	yes	----	no	----	"	----	----	----	----	"	"	534
s-mo.	no	----	----	----	----	----	----	8 00	yes	no	"	----	----	----	----	"	"	535
wk.	yes	no	cont.	150	7	yes	yes	----	no	"	"	----	----	----	----	no	no	536
"	"	yes	----	----	----	----	"	----	yes	"	"	----	----	----	----	yes	yes	537
"	"	no	mort.	700	7	yes	"	----	"	"	"	----	----	----	----	"	"	538
"	"	"	"	250	3	"	"	----	"	"	"	----	----	----	----	"	"	539
"	----	----	----	----	----	----	----	----	"	----	"	----	----	----	----	"	"	540
s-mo.	no	----	----	----	----	----	----	8 00	"	----	"	----	----	----	----	"	"	541
"	yes	yes	----	----	----	----	yes	----	"	no	"	----	----	----	----	"	"	542
wk.	no	----	----	----	----	----	----	5 00	no	"	"	----	----	----	----	"	"	543
"	"	----	----	----	----	----	----	8 00	"	"	"	----	----	----	----	"	"	544
"	"	----	----	----	----	----	----	13 00	"	"	"	----	----	----	----	"	"	545
"	"	----	----	----	----	----	----	9 00	yes	"	"	----	----	----	----	"	"	546
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	547
"	no	----	----	----	----	----	----	10 00	no	"	"	----	----	----	----	"	"	548
"	----	----	----	----	----	----	--	----	"	"	"	----	----	----	----	"	"	549
"	----	----	----	----	----	----	--	----	"	"	"	----	----	----	----	"	"	550

Book No. 16.

Table No. 1.—Continued.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time	Amount earned in past year.	Amount saved in past year.
751	Charlotte	22	Am.	----	s	--	--	Woodworker	wk.	10	yes	$1 09	60	Lack of work	$275	$40
752	"	29	"	----	m	3	--	"	"	10	"	1 08	80	" "	251	none
753	Marshall	28	"	----	s	--	--	"	pc.	10	no	2 00	30	" "	566	150
754	Charlotte	28	"	----	"	--	--	"	"	10	yes	1 75	60	" "	443	200
755	"	23	"	----	m	2	--	"	day	10	"	1 00	90	" "	223	none
756	"	28	Can.	10	"	2	2	"	wk.	10	no	1 00	100	" "	213	"
757	Lowell	36	Fr.	----	"	2	1	"	pc.	9	"	1 75	155	" "	277	"
758	"	42	Irish	20	"	2	4	"	"	10	"	2 00	112	" "	402	"
759	"	46	Am.	----	"	2	3	"	"	10	"	1 50	100	" "	819	"
760	"	60	"	----	"	3	--	"	"	10	"	1 25	156	" "	191	"
761	"	29	"	----	"	2	3	"	"	10	"	1 00	90	" "	223	"
762	"	58	"	----	"	3	--	"	"	10	"	75	200	Sickness*	85	"
763	"	46	"	----	"	2	--	"	"	10	"	2 00	90	Lack of work	446	100
764	"	39	Scot	----	s	--	--	"	"	10	"	2 00	156	" "	314	none
765	"	27	Am.	----	"	--	--	"	"	10	"	1 75	90	" "	390	"
766	"	85	Swiss	6	m	2	5	"	"	10	"	1 75	150	" "	283	"
767	Wayne	20	Am.	----	s	--	--	"	"	10	yes	1 00	60	" "	253	"
768	"	87	"	----	m	2	3	"	"	10	"	2 00	60	Sickness*	506	"
769	"	33	Scot.	8	"	2	1	"	"	10	no	2 00	90	Lack of work	446	"
770	"	48	Am.	----	"	2	2	"	"	10	"	1 65	40	" "	450	"
771	"	32	Scot.	12	"	2	1	"	day	10	"	2 15	30	" "	608	70
772	"	39	Am	----	"	2	3	"	"	10	yes	1 75	30	Sickness	495	150
773	"	30	"	----	s	--	--	"	pc.	10	"	2 00	60	Vacation*	506	none
774	"	36	"	----	"	--	--	"	"	10	"	2 00	60	Sickness *	506	200
775	Saginaw	31	"	----	"	--	--	"	day	10	no	2 00	7	Vacation	612	200
776	"	33	"	----	m	2	1	"	"	10	"	2 25	40	Sickness	614	none
777	"	40	Ger.	----	"	2	2	"	pc.	10	yes	3 00	104	Lack of work	627	"
778	"	29	"	----	"	2	1	"	day	10	no	1 00	130	Sickness	183	"
779	"	20	Can.	15	s	--	--	"	"	10	yes	1 00	78	" ----	235	"
780	"	37	Am.	----	m	2	2	"	"	10	"	1 00	30	Lack of work	283	"
781	"	32	"	----	"	2	4	"	"	10	"	1 12	150	" "	183	"
782	"	17	"	----	s	--	--	"	"	10	"	75	none	---------------	235	"
783	"	22	Ger.	----	"	--	--	"	"	10	"	1 50	104	Lack of work	314	"
784	"	43	Am.	----	m	2	1	"	"	10	no	1 50	104	" "	314	"
785	Traverse City	31	"	----	"	2	--	"	"	10	"	2 25	none	---------------	704	300
786	" "	38	Ger.	16	"	4	--	"	"	10	"	2 25	4	Vacation	695	200
787	" "	26	"	20	s	--	--	"	wk.	10	"	1 50	12	Sickness	453	100
788	" "	21	Boh.	15	"	--	--	"	day	10	"	1 50	60	Lack of work	380	none
789	" "	42	Irish	16	m	4	--	"	"	10	"	2 00	none	---------------	626	"
790	Marshall	48	Am.	----	"	2	1	"	"	10	"	1 50	50	Lack of work	395	"
791	"	27	"	---	s	--	--	"	"	10	"	1 75	30	Vacation	493	300
792	"	21	"	----	m	2	1	"	pc.	10	----	1 25	none	---------------	391	75
793	"	45	"	----	"	3	--	"	day	10	no	1 75	30	Vacation	495	200
794	"	32	Can.	18	s	--	--	"	"	10	"	2 25	21	Lack of work	659	300
795	"	37	Am.	----	m	2	1	"	"	10	"	2 25	30	Sickness	687	135
796	"	19	"	---	s	--	--	"	"	10	"	60	14	" -----	179	none
797	"	27	Ger.	----	m	2	1	"	"	10	"	1 75	30	" * ---	493	"
798	"	34	"	----	"	2	2	"	"	10	"	2 50	10	" -----	758	"
799	"	32	Am.	----	"	2	--	"	"	10	"	1 25	10	Vacation	379	50
800	Battle Creek	21	"	----	s	--	--	"	"	10	yes	1 21	20	Lack of work	380	75

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* And lack of work.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
yes									yes	yes	None					yes	yes	751
"	no							$6 00	"	"	"					"	no	752
no											"					"	"	753
yes									yes	yes	"					"	"	754
"	no							6 00	no	no	"					"	yes	755
no	"							5 00	"	"	"					"		756
"	"							7 00	yes	"	"					"	yes	757
"	yes	no	cont.	$300	7	yes	yes		"	"	"					"	"	758
"	no							4 00	no	"	"					"	no	759
"	yes	yes					yes		yes		"					no	"	760
"	no							5 00			"					yes	yes	761
"	yes	yes					yes		no	no	"					"	"	762
"	"	"					"				"					"	no	763
"											"					"	yes	764
"	no							4 00	yes	yes	"					"	"	765
"	yes	no	cont.	100	7	no	yes				"					"		766
yes											"					"	yes	767
"	no							7 00			"					"	"	768
no	"							4 00	yes	no	"					"	"	769
"	"							5 00	"	"	"					"	"	770
"	"							8 00			"					"	"	771
yes	yes								no		"					"	"	772
"									yes		"					"	"	773
"									"		"					"	"	774
no											M. Woodw'k'rs U.	no	no	no	no	"	"	775
"	no							5 00	yes	no	None					"	no	776
yes	yes	yes					yes		"	"	"						yes	777
no	no							3 00			"					no	no	778
yes											"					"	yes	779
"											"					yes	"	780
"	no							4 00	yes		"					"	no	781
"											"							792
"									yes	no	"						yes	783
no	yes	no	mort.	400	8	yes	yes		"	"	M. Woodw'k'rs U.	yes	no	yes	yes	no	no	784
"	"	yes									None							785
"	no										"							786
"											"							787
"											"							788
"	no							6 00			"					yes		789
"	"							6 00	no	no	"					"	yes	790
"									"	"	"					"	"	791
											"					"	"	792
no	yes	no	mort.	2,000	6	yes	yes		no	no	"					no	"	793
"									yes	"	"					yes	"	794
"	yes	no	mort.	300	7	yes	yes		"	"	"					"	"	795
"											"					"	"	796
"	no										"					no	no	797
"	"										"					yes	yes	798
"	"										"					"	"	799
yes									no	no	"					"	"	800

Book No. 17. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
801	Battle Creek	35	Am.	----	m	2	1	Woodworker	day	10	yes	$1 33	35	Laid off	$420	$80
802	" "	24	Irish	----	"	2	--	"	"	10	"	1 23	13	Lack of work	369	50
803	" "	30	"	----	"	2	--	"	"	10	"	1 35	30	Laid off	425	100
804	" "	23	Am.	----	s	--	--	"	"	10	"	1 30	20	"	410	----
805	" "	20	"	----	"	--	--	"	"	10	"	1 17	38	"	350	50
806	Manistee	45	Swe.	23	"	--	--	"	"	10	no	1 50	none	----	470	none
807	"	32	Scot.	8	"	--	--	"	"	10	"	2 00	30	Sickness	566	"
808	"	32	Ger.	20	m	2	1	"	"	10	"	2 00	20	"	586	100
809	"	30	"	----	s	--	--	"	"	10	"	2 25	30	Vacation	637	----
810	Mt. Clemens	28	Fr.	----	"	--	--	"	"	10	"	1 12	32	Holidays*	315	none
811	"	20	Ger.	----	"	--	--	"	"	10	"	1 00	12	" *	301	200
812	"	35	"	----	m	2	--	"	"	10	"	1 75	12	" *	527	300
813	"	39	Am	----	"	2	--	"	"	10	yes	2 00	30	" *	700	200
814	"	33	Ger.	7	"	2	2	"	"	10	"	1 67	10	" †	700	200
815	"	35	Fr.	----	"	2	1	"	"	10	"	1 67	30	" *	700	250
816	Albion	24	Am.	----	"	2	--	"	"	10	no	1 60	10	----	485	150
817	"	19	"	----	s	--	--	"	pc.	10	"	1 35	30	----	382	100
818	"	46	"	----	m	2	2	"	day	10	yes	1 75	none	----	550	200
819	"	36	"	----	"	2	--	"	pc.	10	no	1 50	60	Lack of work	380	----
820	"	46	"	----	"	2	1	"	day	10	"	1 50	5	----	462	150
821	Jonesville	46	"	----	"	3	2	"	"	10	"	1 50	none	----	470	none
822	"	52	"	----	"	2	2	"	"	10	"	2 00	"	----	626	"
823	"	33	"	----	"	2	3	"	"	10	"	1 40	"	----	438	"
824	"	35	"	----	"	2	4	"	"	10	"	2 00	10	Lack of work	608	"
825	"	21	Ger.	----	s	3	4	"	pc.	10	"	1 00	15	" "	298	25
826	"	51	"	----	m	6	2	"	"	10	"	1 75	60	Sickness	443	none
827	Ionia	58	Am.	----	"	4	--	"	day	10	"	1 04	60	Lack of work	263	"
828	"	50	"	----	"	2	--	"	"	10	"	1 75	40	" "	478	"
829	"	65	"	----	"	5	--	"	"	10	"	1 50	70	" "	365	"
830	"	24	"	----	s	--	--	"	"	10	"	1 40	60	" "	354	"
831	"	39	"	----	m	4	2	"	"	10	"	1 75	60	" "	343	"
832	"	59	"	----	"	3	--	"	"	10	"	1 75	60	" "	343	"
833	"	40	"	----	"	2	3	"	"	10	"	1 25	78	" " *	294	"
834	"	50	"	----	"	2	1	"	"	10	"	1 60	60	" "	405	"
835	Coldwater	27	"	----	"	2	1	"	"	10	yes	1 25	36	" "	346	40
836	"	58	"	----	"	2	1	"	pc.	10	no	1 00	150	" "	163	none
837	"	66	Ger.	40	s	4	1	"	"	10	"	1 00	13	Pleasure	300	"
838	"	52	Am	----	m	2	2	"	day	10	yes	1 50	30	Lack of work*	425	"
839	Ovid	35	"	----	"	2	3	"	pc.	10	no	2 50	113	Other work	500	"
840	"	41	"	----	"	3	--	"	"	10	"	2 00	100	" "	426	----
841	"	56	"	----	s	--	--	"	day	10	"	1 50	113	" "	300	150
842	"	35	"	----	m	2	3	"	"	10	"	1 75	30	Lack of work	495	none
843	"	27	"	----	"	2	--	"	"	10	"	1 50	156	Other work	236	----
844	"	19	"	----	s	--	--	"	"	10	"	85	182	" "	111	----
845	Monroe	54	Ger.	48	m	2	2	"	"	10	"	1 75	33	Sickness	490	75
846	"	54	"	50	"	2	2	"	"	10	"	1 50	20	"	440	----
847	"	27	"	----	"	3	1	"	"	10	"	1 52	14	Other business*	449	----
848	"	17	Am.	----	s	--	--	"	"	10	"	50	none	----	156	none
849	Linden	50	"	--	m	2	6	"	"	10	"	2 50	150	Lack of work	408	"
850	"	60	Eng.	55	"	2	3	"	"	10	"	1 50	150	" " *	245	"

* And sickness.
† And other business.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	no	----	----	----	----	----	----	$7 50	----	----	None	----	----	----	----	yes	no	801
“	“	----	----	----	----	----	----	7 00	yes	no	“	----	----	----	----	“	yes	802
“	yes	yes	----	----	----	----	no	----	----	----	“	----	----	----	----	“	no	803
“	----	----	----	----	----	----	----	----	no	no	“	----	----	----	----	“	“	804
“	no	----	----	----	----	----	----	7 00	“	“	“	----	----	----	----	“	“	805
“	----	----	----	----	----	----	----	----	----	----	Swedish Society	yes	yes	no	no	no	yes	806
“	----	----	----	----	----	----	----	----	yes	no	None	----	----	----	----	yes	“	807
“	yes	yes	----	----	----	----	yes	----	----	----	“	----	----	----	----	“	“	808
“	----	----	----	----	----	----	----	----	----	----	“	----	----	----	----	----	----	809
“	----	----	----	----	----	----	----	----	----	----	*	no	yes	no	no	yes	yes	810
“	----	----	----	----	----	----	----	----	----	----	*	“	“	“	“	“	“	811
“	yes	no	cont.	$200	6	yes	yes	----	----	----	*	“	“	“	“	“	“	812
“	no	----	----	----	----	----	----	8 00	no	no	*	“	“	“	“	“	no	813
“	“	----	----	----	----	----	----	8 00	----	----	*	“	“	“	“	no	“	814
“	yes	no	mort	950	7	yes	yes	----	yes	no	*	“	“	“	“	yes	yes	815
“	no	----	----	----	----	----	----	7 50	“	yes	None	----	----	----	----	“	“	816
“	----	----	----	----	----	----	----	----	----	----	“	----	----	----	----	“	“	817
“	yes	no	mort.	600	6	yes	yes	----	yes	no	“	----	----	----	----	“	“	818
“	no	----	----	----	----	----	----	4 50	no	“	“	----	----	----	----	“	“	819
“	“	----	----	----	----	----	----	----	yes	“	“	----	----	----	----	“	“	820
s-mo	“	----	----	----	----	----	----	5 00	“	“	“	----	----	----	----	“	“	821
“	yes	yes	----	----	----	----	yes	----	“	yes	“	----	----	----	----	“	“	822
“	“	“	----	----	----	----	“	----	no	no	“	----	----	----	----	“	“	823
“	no	----	----	----	----	----	----	5 00	“	“	“	----	----	----	----	“	“	824
“	----	----	----	----	----	----	----	----	“	“	“	----	----	----	----	“	“	825
“	yes	yes	----	----	----	----	yes	----	“	“	“	----	----	----	----	“	“	826
“	“	no	mort	100	8	yes	“	----	“	“	“	----	----	----	----	“	“	827
“	no	----	----	----	----	----	----	8 00	“	“	“	----	----	----	----	“	“	828
“	yes	yes	----	----	----	----	yes	----	yes	“	“	----	----	----	----	“	“	829
“	----	----	----	----	----	----	----	----	----	----	“	----	----	----	----	“	“	830
“	no	----	----	----	----	----	----	5 00	----	----	“	----	----	----	----	“	“	831
“	“	----	----	----	----	----	----	8 00	----	----	“	----	----	----	----	“	“	832
“	yes	yes	----	----	----	----	yes	----	----	yes	“	----	----	----	----	“	----	833
“	“	no	----	----	----	----	“	----	yes	no	“	----	----	----	----	“	yes	834
wk.	no	----	----	----	----	----	----	7 00	“	“	“	----	----	----	----	“	“	835
“	yes	yes	----	----	----	----	yes	----	no	“	“	----	----	----	----	“	“	836
“	“	“	----	----	----	----	“	----	“	“	“	----	----	----	----	“	“	837
“	“	“	----	----	----	----	“	----	“	“	“	----	----	----	----	“	“	838
s-mo.	“	no	mort.	400	7	yes	“	----	yes	yes	“	----	----	----	----	“	“	839
“	“	“	“	800	8	“	“	----	“	no	“	----	----	----	----	“	----	840
“	“	“	----	300	8	“	“	----	no	“	“	----	----	----	----	“	yes	841
“	“	“	cont.	50	----	no	no	----	----	----	“	----	----	----	----	“	----	842
“	“	“	mort.	100	7	“	yes	----	no	no	“	----	----	----	----	“	yes	843
“	----	----	----	----	----	----	----	----	“	“	“	----	----	----	----	“	“	844
wk.	yes	yes	----	----	----	----	yes	----	yes	“	“	----	----	----	----	“	no	845
“	----	----	----	----	----	----	----	----	“	----	“	----	----	----	----	“	----	846
“	yes	yes	----	----	----	----	yes	----	“	no	“	----	----	----	----	“	no	847
“	----	----	----	----	----	----	----	----	no	“	“	----	----	----	----	“	yes	848
“	no	----	----	----	----	----	----	4 50	----	----	“	----	----	----	----	“	“	849
“	yes	no	----	----	----	----	yes	----	no	----	“	----	----	----	----	“	“	850

* Donaldson Bros. Employés Sick and Accident Benefit Association.

Book No. 18. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' lost time in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
851	Linden	47	Can.	31	m	2	2	Woodworker	pc.	10	no	$2 00	150	Lack of work*	$326	none
852	Benton H'b'r	56	Am.	----	"	5	--	"	day	10	"	1 50	100	" "	320	------
853	" "	27	Ger.	5	s	--	--	"	"	10	"	1 50	5	Holidays	462	$5
854	Allegan	44	Can.	27	m	2	2	"	"	10	"	1 50	60	" †	452	none
855	"	65	Am.	----	s	--	--	"	wk.	10	"	1 00	65	Lack of work*	248	"
856	Bay City	43	"	----	m	2	3	"	day	10	yes	1 50	78	Sickness	353	"
857	Buchanan	50	"	----	"	2	--	"	"	10	no	2 25	30	Various	637	------
858	White Pigeon	65	"	----	"	2	4	"	"	10	"	1 60	90	Lack of work	357	none
859	Escanaba	20	Ger.	----	s	--	--	"	mo.	10	yes	1 50	6	----------------	461	"
860	Iron Mount'n	35	Can.	10	m	2	4	"	day	10	----	2 50	none	----------------	783	300
861	Lapeer	47	"	----	"	2	4	"	"	10	no	1 50	90	Lack of work	334	none
862	Owosso	29	Am.	----	--	-	--	"	"	10	"	1 80	150	" "	293	"
863	Plymouth	29	Fr.	5	m	2	--	"	"	10	yes	1 75	6	Pleasure	537	90
864	Romeo	74	Am.	----	"	2	1	"	"	10	no	1 75	63	Sickness	437	none
865	White Pigeon	40	"	----	"	2	5	"	"	10	"	1 60	12	"	482	"
866	Three Rivers	26	"	----	"	2	--	Iron worker	"	10	"	1 65	6	Lack of work	505	150
867	" "	25	"	----	"	2	--	"	"	10	yes	1 34	26	Vacation	385	50
868	" "	32	"	----	"	2	-	"	"	10	"	1 40	60	Lack of work*	354	none
869	" "	18	"	----	s	-	--	"	"	10	"	70	62	" "	177	"
870	" "	33	"	----	m	2	2	"	"	10	"	1 50	10	Sickness	455	"
871	" "	27	"	----	s	2	--	"	"	10	no	96	25	Lack of work	276	75
872	" "	35	"	----	m	2	2	"	"	10	yes	1 31	69	" "	320	none
873	" "	46	"	----	"	2	2	"	"	10	no	1 00	20	" "	293	"
874	" "	36	"	----	"	2	1	"	"	10	"	1 33	15	" "	396	"
875	" "	21	"	----	"	2	--	"	"	10	"	99	10	" "	300	50
876	" "	39	"	----	"	2	3	"	"	10	yes	1 50	13	" "*	450	50
877	" "	26	"	----	"	2	2	"	"	10	no	1 11	20	" "	325	none
878	" "	40	"	----	"	2	2	"	"	10	"	1 03	20	" "	302	"
879	" "	27	"	----	s	--	--	"	"	10	"	1 67	18	" "*	125	493
880	" "	36	"	----	m	2	3	"	"	10	"	1 10	50	Sickness	289	none
881	" "	33	"	----	"	2	2	"	"	10	yes	1 61	16	Holidays	479	100
882	" "	45	"	----	"	2	1	"	"	10	no	1 33	30	Lack of work	376	none
883	" "	21	"	----	"	2	--	"	pc.	10	----	1 75	8	" "	534	"
884	" "	18	"	----	s	2	--	"	day	10	no	1 25	30	Vacation*	355	"
885	" "	25	"	----	m	2	--	"	"	10	"	1 70	20	Lack of work†	498	200
886	Jackson	27	"	----	"	2	1	"	"	10	"	1 50	none	----------------	470	75
887	"	36	Ger.	16	"	2	1	"	pc.	10	yes	1 75	6	Other work	527	100
888	"	20	Am.	----	"	2	--	"	day	10	no	1 25	6	Sickness	384	80
889	"	30	"	----	"	2	1	"	"	10	yes	1 25	12	Accident	376	none
890	"	24	"	----	s	--	--	"	"	10	"	1 75	6	Sickness	537	75
891	Lansing	31	Ger.	14	m	2	2	"	"	10	no	1 40	2	"	435	none
892	Romeo	36	Am.	----	"	2	--	"	"	10	yes	2 50	none	----------------	782	"
893	Saginaw	41	Can.	18	"	2	3	"	"	10	no	1 25	208	Lack of work*	130	"
894	Kalamazoo	27	Ger.	----	"	2	2	Machine man	"	10	----	2 00	30	" "	566	175
895	"	30	Am.	----	"	2	1	"	"	10	----	1 65	35	" "	459	50
896	"	35	"	----	"	2	2	"	"	10	----	2 00	60	----------------	506	75
897	"	37	"	----	"	2	1	"	"	10	----	2 00	90	Lack of work	446	none
898	"	30	"	----	"	2	1	"	"	10	----	2 00	35	" "	278	"
899	"	30	"	----	"	2	1	"	"	10	----	2 00	30	" "	566	110
900	"	22	Hol.	15	s	--	--	"	"	10	----	2 00	65	" "	496	none

* And sickness.
† And vacation.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	yes	no	mort.	$50	7	yes	no		yes	no	None					yes	yes	851
"	no							$3 75			"					"	"	852
"											"					no	no	853
"	no							8 00	yes		"					yes	yes	854
"									"		"					"	"	855
"	no							7 00	"	no	"					"	"	856
s-mo.	"								no	"	"					"	"	857
"	yes	no				yes	yes		"		"					"	"	858
mo.											"							859
"	no							13 00	no		"					no		860
wk.	yes	no	cont.	400	7	no	no		"	no	"					yes	yes	861
"									yes	"	"					"		862
"	no							3 00			"					"	yes	863
"	"							8 00	no	no	"					"	"	864
s-mo.	yes								yes	"	"					"	"	865
wk.	no								no	"	"					no	"	866
"	"								"	yes	"					yes	"	867
"	"							5 50	"	"	"					"	"	868
"									"	no	"					no	no	869
"	no							4 00	"	"	"					yes	yes	870
"	yes	yes					no		"	yes	"					"	"	871
"	"	"					"		"	no	"					"	"	872
"	"	"					yes		yes	yes	"					"	"	873
"	"	"					"		"	no	"					"	"	874
"	no							4 00	no	yes	"					"	"	875
"	"							8 00	yes	no	"					"	"	876
"	"							4 00	no	"	"					"	"	877
"	yes	yes					yes		yes	"	"					no	"	878
"									"	yes	"					yes	"	879
"	yes	no	mort.	80	7	no	yes		no	no	"					"	"	880
"	"	"	"	500	7	yes	"		yes	yes	"					"	"	881
"	"	yes					"		"	"	"					"	"	882
"	no							5 00	no	"	"					"	"	883
"									"	no	"					"	"	884
"	no							5 00	"	"	"					no	no	885
"	yes	no	cont.	500	7	yes	yes		"	"	"					yes	yes	886
"	"	"	mort.	100	7	"	"		yes	"	"					"	"	887
"	"	yes					"		no	"	"					"	"	888
"	no							8 00	"	"	"					"	"	889
"									"	"	"					"	"	890
"	yes	no	mort.	700	7	yes	yes		yes	yes	"					"	"	891
"	"	yes					"		no	no	"					"	"	892
s-mo.	no							4 50	yes	yes	"					"	"	893
wk.	"							6 50			Wheelm'k's Union					"	"	894
"	yes	no	cont.	300	7	yes	yes				" "					"	"	895
"	no							7 00			" "					"	"	896
"	"							8 00			" "					"	"	897
"	"							7 00	yes		" "					"	"	898
"	yes	yes					yes				" "					"	"	899
"											" "					no	no	900

Book No. 19.

Table No. 1.—Continued.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
901	Kalamazoo	19	Am.	----	s	--	--	**Machine man**	day	10	no	$1 00	30	Lack of work	$283	$25
902	"	24	"	----	"	--	--	"	"	10	"	2 00	45	" "	536	none
903	"	26	"	----	m	2	--	"	"	10	----	2 00	none	----------------	626	300
904	"	23	"	----	s	--	--	"	"	10	----	1 75	60	Lack of work	443	none
905	"	35	Ger.	20	m	2	1	"	"	10	----	1 75	30	" "	495	150
906	"	30	Hol.	20	"	2	3	"	"	10	----	1 75	90	" "	390	100
907	"	42	Am.	----	"	2	3	"	"	10	----	2 25	35	" "	626	150
908	"	28	"	----	"	2	2	"	"	10	----	2 00	30	" "	566	175
909	"	26	"	----	s	--	--	"	"	10	----	2 00	90	" "	446	100
910	"	43	Ger.	23	m	2	1	"	"	10	----	2 00	30	" "	566	225
911	"	40	Am.	----	"	2	1	"	"	10	----	2 00	35	" "	556	150
912	"	25	"	----	s	--	--	"	pc.	10	----	2 50	45	" "	770	100
913	"	22	"	----	"	--	--	"	day	10	----	1 50	60	" "	380	15
914	"	19	"	----	"	--	--	"	"	10	----	75	none	----------------	235	none
915	"	19	"	----	"	--	--	"	"	10	----	75	30	Lack of work	212	"
916	"	27	Hol.	----	m	2	1	"	"	10	----	1 20	60	" "	329	25
917	"	21	Am.	----	s	--	--	"	"	10	no	1 40	10	" "	424	100
918	"	21	"	----	"	--	--	"	"	10	----	1 25	60	" "	316	none
919	"	38	Hol.	20	m	2	3	"	"	10	----	1 40	60	" "	354	100
920	"	55	Am.	----	"	2	1	"	"	10	----	1 25	none	----------------	391	75
921	"	28	"	----	"	2	1	"	"	10	----	1 25	"	----------------	391	none
922	"	17	"	----	s	--	--	"	"	10	----	50	"	----------------	142	"
923	"	17	Hol	15	"	--	--	"	"	10	----	50	30	Lack of work	142	"
924	"	65	Am.	----	m	2	1	"	"	10	----	1 50	60	" "	380	"
925	"	32	"	----	"	2	2	"	"	10	no	1 50	60	" "	380	50
926	"	28	"	----	"	2	--	"	"	10	----	1 40	60	" "	354	none
927	"	30	"	----	"	2	--	"	"	10	----	1 25	60	" "	316	10
928	"	26	"	----	s	--	--	"	"	10	----	1 25	60	" "	316	none
929	"	25	"	----	"	--	--	"	"	10	----	1 75	90	" "	390	"
930	"	23	"	----	"	--	--	"	"	10	----	2 00	30	" "	566	175
931	"	32	"	----	"	--	--	"	"	10	----	2 00	90	" "	336	100
932	"	31	"	----	"	--	--	"	"	10	----	2 00	150	" "	326	none
933	"	31	"	----	"	--	--	"	"	10	----	2 25	100	" "	479	80
934	"	23	"	----	"	--	--	"	"	10	----	1 00	30	" "	283	10
935	"	36	Hol.	20	m	2	3	"	"	10	----	2 00	100	" "	426	none
936	"	36	Am.	----	"	2	1	"	"	10	----	2 10	150	" "	342	"
937	"	24	"	----	"	2	1	"	"	10	----	1 50	100	" "	320	25
938	"	26	"	----	s	--	--	"	"	10	----	1 75	110	" "	530	none
939	"	23	"	----	"	--	--	"	"	10	----	1 50	100	" "	320	"
940	"	21	"	----	"	--	--	"	"	10	----	1 50	90	" "	334	50
941	"	45	Hol.	----	m	2	2	"	"	10	----	1 25	150	" "	244	none
942	"	19	Scot.	----	s	--	--	"	pc.	10	----	1 00	10	" "	303	120
943	"	19	Am.	----	"	--	--	"	day	10	----	1 00	50	" "	263	80
944	"	22	"	----	"	--	--	"	"	10	----	1 00	35	" "	278	75
945	"	25	"	----	m	2	--	"	pc.	10	----	1 75	30	" "	495	300
946	"	35	"	----	s	--	--	"	day	10	----	1 00	30	" "	283	25
947	"	18	"	----	"	--	--	"	"	10	----	1 00	30	" "	283	none
948	"	31	"	----	"	--	--	"	"	10	no	1 50	45	" "	402	"
949	"	20	"	----	"	--	--	"	"	10	"	1 00	60	" "	253	"
950	"	19	"	----	"	--	--	"	"	10	"	1 00	60	" "	253	"

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.											None					yes	yes	901
"											"					"	"	902
"	no								yes	no	"					"	"	903
"											Wheelm'k's Union					"	"	904
"	no							$6 50	yes		" "					no	no	905
"	yes	yes					yes				" "					"	"	906
"	"	"					"		yes		" "					yes	yes	907
"	"	no	mort.	$300	7	yes					" "					"	"	908
"											" "					"	"	909
"	yes	yes					yes		yes		" "					no	no	910
"											" "					yes	yes	911
"									yes		None					"	"	912
"											"					"	"	913
"											"					"	"	914
"											"					"	"	915
	yes	no	mort.	150	7	yes	yes				"					"	"	916
mo.											"					"	"	917
"											"					"	"	918
"	yes	yes					yes				"					no	no	919
wk.	"	"					"		yes		"					yes	yes	920
mo.	"	"					"				"					"	"	921
"											"					"	"	922
"											"					no	no	923
"	yes	yes					yes				"					yes	yes	924
"	no							7 00			"					"	"	925
"	"							7 00			"					"	"	926
"	"							8 00			"					"	"	927
"											"					"	"	928
wk.									no		"					"	"	929
"											"					"	"	930
"											"					"	"	931
"									yes		"					"	"	932
"											"					"	"	933
"											"					"	"	934
"	yes	yes					yes				"					no	no	935
"	"	no	mort.	200	7	yes	"				"					yes	yes	936
"	"	"	cont.	300	6	"					"					"	"	937
"									yes		"					"	"	938
"											"					"	"	939
"											"					"	"	940
-mo.	yes	yes					yes		yes		"					no	no	941
mo.											"					"	"	942
"											"					yes	yes	943
"											"					no	no	944
"											"					"	"	945
"											"					yes	yes	946
"											"					"	"	947
"									no		"					"	"	948
wk.											"					"	"	949
"											"					"	"	950

Book No. 20. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
951	Kalamazoo.	24	Am.	----	s	--	--	Machine man	day	10	----	$1 50	60	Lack of work	$380	none
952	"	20	"	----	"	--	--	"	"	10	----	1 35	30	----------------	382	"
953	"	27	"	----	"	--	--	"	pc.	10	----	2 20	30	Lack of work	623	$200
954	"	47	"	----	m	4	3	"	day	10	----	1 35	10	" "	409	none
955	"	23	"	----	s	--	--	"	"	10	no	1 40	90	" "	312	"
956	"	25	"	----	m	2	1	"	"	10	"	1 40	30	" "	396	"
957	"	25	"	----	s	--	--	"	"	10	----	1 60	30	" "	453	50
958	"	30	"	----	m	2	1	"	"	10	----	1 50	30	" "	425	10
959	"	41	"	----	"	2	1	"	"	10	----	2 40	30	" "	679	50
960	"	30	"	----	"	2	2	"	"	10	----	1 35	35	" "	375	10
961	"	23	"	----	s	--	--	"	"	10	----	2 00	30	" "	566	100
962	"	35	"	----	m	2	2	"	"	10	no	2 25	40	" "	614	200
963	"	26	"	----	s	--	--	"	"	10	----	2 25	30	" "	637	none
964	"	35	"	----	m	2	3	"	"	10	no	2 25	60	" "	569	150
965	"	30	"	----	"	2	2	"	"	10	----	2 25	30	" "	637	150
966	"	40	"	----	"	2	--	"	"	10	----	1 25	30	" "	354	none
967	"	21	"	----	s	--	--	"	"	10	----	1 50	30	" "	425	"
968	"	22	"	----	"	--	--	"	"	10	----	1 90	30	" "	538	"
969	"	25	"	----	m	2	2	"	"	10	----	1 90	30	" "	538	50
970	"	35	"	----	"	2	3	"	"	10	----	2 00	60	" "	506	75
971	"	35	"	----	"	2	2	"	"	10	----	2 10	45	" "	563	50
972	"	21	"	----	s	--	--	"	"	10	----	1 25	30	" "	354	none
973	"	30	"	----	m	2	1	"	pc.	10	----	2 00	30	" "	566	50
974	"	30	"	----	"	2	1	"	"	10	no	2 25	30	" "	637	200
975	"	28	Ger.	25	"	2	--	"	"	10	----	2 00	30	" "	566	175
976	"	33	Am.	----	"	2	2	"	"	10	----	2 25	30	" "	637	130
977	"	35	"	----	"	2	2	"	day	10	----	2 40	30	" "	679	100
978	"	35	"	----	"	2	2	"	pc.	10	----	2 30	40	" "	628	200
979	"	30	"	----	"	2	1	"	"	10	no	2 25	30	" "	637	110
980	"	40	"	----	"	2	2	"	"	10	----	2 40	60	" "	607	150
981	"	21	"	----	s	--	--	"	day	10	no	1 50	30	" "	425	none
982	"	21	"	----	"	--	--	"	pc.	10	"	2 00	none	----------------	626	225
983	"	42	"	----	m	2	3	"	day	10	"	1 50	10	Lack of work	455	25
984	"	40	"	----	"	2	5	"	"	10	"	1 25	15	" "	373	none
985	"	35	"	----	"	2	1	"	"	10	"	1 50	10	" "	455	"
986	"	18	"	----	s	--	--	"	"	10	"	75	30	" "	212	"
987	"	19	Hol.	15	"	--	--	"	"	10	"	75	60	" "	190	"
988	"	35	Am.	----	"	--	--	"	"	10	"	1 50	10	" "	455	25
989	"	45	"	----	m	2	3	"	"	10	"	1 25	10	" "	379	none
990	"	22	Hol.	----	"	2	--	"	"	10	"	1 35	none	----------------	426	300
991	"	25	Am.	----	s	--	--	"	"	10	"	1 35	10	Lack of work	409	none
992	"	60	"	----	m	2	8	"	"	10	----	1 25	30	" "	354	"
993	"	21	"	----	s	--	--	"	"	10	no	1 10	30	" "	311	25
994	"	25	"	----	m	2	--	"	"	10	"	1 25	60	" "	316	none
995	"	22	"	----	"	2	1	"	"	10	"	1 00	30	" "	283	"
996	"	16	Hol.	10	s	--	--	"	"	10	----	75	30	" "	212	"
997	"	18	Am.	----	"	--	--	"	"	10	----	75	30	" "	212	"
998	"	25	"	----	"	--	--	"	"	10	----	1 25	30	" "	354	"
999	"	17	Hol.	----	"	--	--	"	"	10	----	75	30	" "	212	"
1000	"	30	"	10	m	2	3	"	"	10	no	1 50	30	" "	425	125

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
mo.											None					yes	yes	951
wk.											Wheelm'k's Union					“	“	952
“									yes		“ “	no	yes	no		“	“	953
“	no							$8 00			“ “					“	“	954
“											“ “					“	“	955
“	yes	yes					yes				“ “					“	“	956
“									yes		“ “					“	“	957
“	no							6 00			“ “					“	“	958
“	yes	ye-					yes				“ “					“	“	959
“	“	“					“				“ “					“	“	960
“									yes		“ “					“	“	961
“	yes	yes					yes		“		“ “					“	“	962
“									“		“ “					“	“	963
“	no							9 00	“		“ “					“	“	964
“	“							7 00	“		“ “					“	“	965
“	yes	yes					yes		“		“ “					“	“	966
“											“ “					“	“	967
“											“ “					“	“	968
“	yes	yes					yes				None					“	“	969
“	“	no	mort.	$125	7	yes	“		yes		Wheelm'k's Union					“	“	970
“	no							7 00	“		“ “					“	“	971
“											“ “					“	“	972
“	yes	yes					yes				“ “					“	“	973
“	no							8 00	yes		“ “					“	“	974
“	yes	no	cont.	225	6	yes	yes		“		“ “					no	no	975
“	“	“	“	350	6	“	“				“ “					yes	yes	976
“	“	yes					no				“ “					“	“	977
“	“	“					yes		yes		“ “					“	“	978
“	no							8 00			“ “					“	“	979
“	yes	yes					yes		yes		“ “					“	“	980
“											None					“	“	981
“									yes		Wheelm'k's Union					“	“	982
“	yes	no		100	7	yes	yes		“		None					“	“	983
“	“	“	mort.	200	6	“	“		“		“					“	“	984
“	no							7 00			“					“	“	985
“											“					“	“	986
“											“					no	no	987
“									yes		“					yes	yes	988
“	yes	no		500			yes		“		“					“	“	989
“	no							6 00			Wheelm'k's Union					“	“	990
“											None					“	“	991
“	yes	yes					yes		yes		“					“	“	992
“									“		Wheelm'k's Union					“	“	993
“	no							6 50	“		“ “					“	“	994
“	“							6 00			“ “					“	“	995
“											None					“	“	996
“											“					“	“	997
“											Wheelm'k's Union					“	“	998
“											None					“	“	999
“	yes	yes					yes				“					no	no	1000

Book No. 21. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Numb-r children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1001	Kalamazoo.	16	Hol.	8	s	--	--	Machine man	day	10	no	$0 50	10	Lack of work	$152	none
1002	"	50	Am.	----	m	2	2	"	"	10	"	1 25	10	" "	379	"
1003	"	43	"	----	"	2	2	"	"	10	"	1 25	10	" "	379	"
1004	"	19	Hol.	5	s	--	--	"	"	10	"	1 25	25	" "	360	"
1005	"	17	Am.	----	"	--	--	"	"	10	"	50	30	" "	142	"
1006	"	16	"	----	"	--	--	"	"	10	"	50	60	" "	127	"
1007	"	18	"	----	"	--	--	"	"	10	"	66	30	" "	187	"
1008	"	19	"	----	"	--	--	"	"	10	"	1 00	10	" "	303	"
1009	"	20	"	----	m	2	--	"	"	10	"	1 00	10	" "	303	"
1010	"	28	"	----	s	--	--	"	"	10	"	1 75	none	----------	548	$30
1011	"	25	Hol.	10	"	--	--	"	pc.	10	----	1 65	30	Lack of work	467	150
1012	"	21	Am.	----	"	--	--	"	day	10	----	1 00	60	" "	253	none
1013	"	52	Ger.	30	m	2	3	"	"	10	----	1 25	30	" "	354	10
1014	"	50	"	28	"	2	3	"	"	10	----	1 10	30	" "	311	20
1015	"	16	Hol.	----	s	--	--	"	"	10	----	65	30	" "	184	none
1016	"	50	"	18	m	2	1	"	"	10	----	1 10	35	" "	273	25
1017	"	16	"	15	s	--	--	"	"	10	no	75	30	" "	212	none
1018	"	23	"	----	"	--	--	"	"	10	"	1 25	30	" "	354	"
1019	"	29	"	--	m	2	--	"	"	10	"	1 20	30	" "	340	"
1020	"	40	"	19	"	2	5	"	"	10	"	1 40	30	" "	396	75
1021	"	50	Ger.	25	"	2	3	"	"	10	"	1 40	30	" "	396	none
1022	"	50	"	19	"	2	--	"	"	10	"	1 40	30	" "	396	150
1023	"	45	Am.	----	"	2	4	"	pc.	10	"	1 50	10	" "	455	none
1024	"	24	"	----	s	--	--	"	day	10	----	1 35	30	" "	382	"
1025	"	30	Ger.	15	m	2	4	"	"	10	no	1 40	30	" "	396	100
1026	"	23	Am.	----	s	--	--	"	"	10	"	1 40	30	" "	396	50
1027	"	23	"	----	"	--	--	"	"	10	----	1 35	30	" "	382	10
1028	"	20	"	----	"	--	--	"	"	10	----	1 25	30	" "	554	none
1029	"	30	Hol.	----	m	2	4	"	"	10	----	1 50	30	" "	425	25
1030	"	25	Am.	----	"	2	--	"	"	10	----	1 65	30	" "	467	100
1031	"	35	"	----	"	2	2	"	"	10	no	1 50	none	----------	470	100
1032	"	20	"	----	s	--	--	"	"	10	----	1 10	90	Lack of work	245	none
1033	"	30	"	----	m	2	2	"	"	10	no	1 50	none	----------	470	125
1034	"	25	"	----	s	--	--	"	"	10	----	1 25	30	Lack of work	354	none
1035	"	19	"	---	"	--		"	"	10	no	1 00	30	" "	313	"
1036	"	25	"	---	"	--	--	"	"	10	"	1 40	30	" "	396	15
1037	"	40	"	----	m	2	2	"	"	10	"	2 20	30	" "	623	200
1038	"	17	"	----	s	--	--	"	"	10	"	1 00	none	----------	313	90
1039	"	22	Hol.	---	"	--	--	"	"	10	"	1 35	30	Lack of work	382	10
1040	"	23	"	5	"	--	--	"	"	10	"	1 35	30	" "	382	none
1041	"	20	"	16	"	--	--	"	"	10	"	75	120	" "	143	10
1042	"	21	Am.	----	"	--	--	"	"	10	"	1 00	130	" "	183	25
1043	"	18	"	----	"	--	--	"	"	10	"	1 00	75	" "	230	45
1044	"	26	Irish	21	"		--	"	"	10	"	1 00	200	" "	113	none
1045	"	16	Am.	----	"	--	--	"	"	10	"	50	60	" "	127	"
1046	"	19	"	----	"			"	"	10	"	66	10	" "	200	"
1047	"	17	"	----	"	--	--	"	"	10	"	66	40	" "	180	"
1048	"	38	"	----	m	2	2	"	"	10	"	1 25	35	" "	348	"
1049	"	16	"	----	s	--	--	"	"	10	----	50	60	----------	127	"
1050	"	25	"	----	"	--	--	"	"	10	no	1 25	10	Lack of work	379	"

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.											None					yes	yes	1001
"	yes	yes					yes		no		"					"	"	1002
"	"	"					"		yes		"					"	"	1003
"											"					"	"	1004
"											"					"	"	1005
"											"					"	"	1006
"											"					"	"	1007
"											"					"	"	1008
"	no							$7 00			"					"	"	1009
"									yes		"					"	"	1010
"											"					no	no	1011
"											"					yes	yes	1012
"	no							6 50	yes		"					"	"	1013
"	yes	no	cont.	$350	7	yes	yes				"					no	no	1014
"											"					yes	yes	1015
"	no							7 00			"					"	"	1016
"											"					no	no	1017
"											Wheelm'k's Union					yes	yes	1018
"	yes	yes					yes				None					no	no	1019
"	"	"					"		yes		Wheelm'k's Union					yes	"	1020
"	no							7 00	"		" "					"	yes	1021
"	yes	yes					yes		"		None					no	no	1022
"	"	"					"		"		Wheelm'k's Union					yes	yes	1023
"									"		" "					"	"	1024
"	yes	no	mort.	300	6	yes	yes				None					no	no	1025
"											Wheelm'k's Union					yes	yes	1026
"											" "					"	"	1027
"									yes		" "					"	"	1028
"	yes	yes					yes				None					"	"	1029
"	no							7 50	yes		Wheelm'k's Union					"	"	1030
"	"								"		" "					"	"	1031
"											None					"	"	1032
"	yes	yes					yes				"					"	"	1033
"											"					"	"	1034
"											"					"	"	1035
"											Wheelm'k's Union					"	"	1036
"	yes	yes					yes		yes		" "					"	"	1037
"											None					"	"	1038
"											Wheelm'k's Union					"	"	1039
"									no		" "					"	"	1040
"											None					"	"	1041
"											"					"	"	1042
"											"					"	"	1043
"											"					"	"	1044
"											"					no	no	1045
"											"					yes	yes	1046
"											"					"	"	1047
"	no							6 00			"					"	"	1048
"											"					no	no	1049
"									yes		"					yes	yes	1050

Book No. 22. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1051	Kalamazoo.	29	Am.	----	m	2	2	Machine man	pc.	10	no	$2 50	35	Lack of work	$695	$300
1052	“	55	“	----	“	2	2	“	“	10	“	2 00	30	“ “	566	100
1053	“	30	“	----	“	2	--	“	“	10	“	3 50	30	“ “	991	400
1054	“	45	“	----	“	3	1	“	day	10	“	1 50	35	“ “	417	none
1055	“	30	“	----	s	--	--	“	“	10	----	1 00	30	“ “	283	“
1056	“	35	“	----	m	2	2	“	“	10	----	1 90	30	“ “	538	50
1057	“	18	“	----	s	--	--	“	“	10	no	75	50	“ “	212	none
1058	“	16	Hol.	12	“	--	--	“	“	10	“	60	30	“ “	170	“
1059	“	26	Am.	----	m	2	--	“	“	10	----	1 65	35	“ “	399	“
1060	“	25	“	----	“	2	1	“	“	10	no	1 75	30	“ “	495	100
1061	“	20	“	----	s	--	--	“	“	10	----	1 00	30	“ “	288	none
1062	“	25	“	----	“	--	--	“	“	10	----	2 10	60	“ “	531	“
1063	“	21	“	----	“	--	--	“	“	10	----	1 25	35	“ “	348	“
1064	“	21	“	----	“	--	--	“	“	10	----	1 50	60	“ “	380	“
1065	“	27	“	----	m	2	2	“	“	10	no	1 25	30	“ “	354	25
1066	G'd Rapids.	38	“	----	s	--	--	“	“	10	“	1 44	none	----	451	none
1067	“	31	“	---	m	2	1	“	“	10	“	1 80	40	Sickness*	491	“
1068	“	49	“	----	“	2	2	“	“	10	“	1 80	52	Lack of work*	470	“
1069	“	27	Hol.	7	“	2	2	“	“	----	“	1 00	none	----	313	“
1070	“	54	Can.	28	“	2	2	“	“	10	“	2 00	30	Lack of work	566	150
1071	“	46	Am.	----	“	2	--	“	“	10	“	2 00	156	“ “	314	none
1072	“	18	Hol.	15	s	--	--	“	wk.	10	“	66	54	“ “	173	“
1073	“	35	“	15	m	2	7	“	day	10	“	1 25	78	“ “	294	“
1074	“	26	Am.	----	s	--	--	“	“	10	“	1 25	60	“ “	316	“
1075	“	39	Eng.	5	m	2	3	“	pc.	10	“	1 25	78	“ “	294	“
1076	“	27	Am.	----	“	2	2	“	day	10	“	1 50	36	Sickness	416	“
1077	“	16	“	----	s	--	--	“	wk.	10	“	50	none	----	157	“
1078	“	43	Irish	28	m	2	6	“	pc.	10	“	1 25	26	Lack of work†	359	“
1079	“	20	Hol.	16	s	--	--	“	day	10	“	1 00	78	“ “	235	“
1080	“	37	Am	----	m	2	--	“	“	10	“	1 75	78	“ “	411	“
1081	“	37	“	----	“	2	--	“	“	10	“	2 50	none	----	782	75
1082	“	50	Can.	46	“	2	3	“	“	10	“	1 75	78	Lack of work	411	none
1083	“	31	Hol.	25	“	2	1	“	“	10	“	1 50	156	“ “	235	“
1084	“	30	“	19	“	2	2	“	“	10	“	1 75	52	“ “	457	“
1085	“	25	“	14	s	--	--	“	“	10	“	2 00	156	“ “	314	“
1086	“	63	Am.	----	m	2	5	“	“	10	“	1 50	156	“ “	235	“
1087	“	50	“	----	“	2	1	“	“	10	“	1 75	78	“ “	411	“
1088	“	26	“	----	s	--	--	“	“	10	“	2 00	none	----	626	“
1089	“	19	“	----	“	--	--	“	“	10	“	1 00	“	----	313	“
1090	“	16	“	----	“	--	--	“	“	10	“	50	“	----	157	“
1091	“	23	“	----	“	--	--	“	“	10	“	1 50	25	Vacation	432	100
1092	“	27	Hol.	15	m	2	1	“	“	10	“	2 00	12	Lack of work	602	100
1093	“	23	Am.	----	“	2	--	“	“	10	“	2 00	104	At school	418	none
1094	“	33	Can.	30	“	2	3	“	“	10	“	1 50	20	Sickness	440	“
1095	“	40	Am.	----	“	2	2	“	“	10	“	2 20	6	“ *	675	150
1096	“	39	Ger.	15	“	2	4	“	“	10	“	1 60	52	Lack of work	418	50
1097	“	20	Am.	----	s	--	--	“	“	10	yes	1 35	300	“ “	23	none
1098	“	42	Ger.	15	m	2	5	“	“	10	“	2 60	none	----	915	150
1099	“	28	“	7	“	2	--	“	“	10	“	1 60	“	----	563	none
1100	“	35	Can.	5	s	--	--	“	“	10	“	1 85	18	Lack of work	618	“

* And vacation.

† And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	yes	no	cont.	$400	6	yes	yes		yes		None					yes	yes	1051
"	"	yes					"				"					"	"	1052
"	"	"					"		yes		"					"	"	1053
"	no							$6 00			Wheelm'k's Union					"	"	1054
"											" "					"	"	1055
"	yes	no	mort.	200	7	yes	yes				" "					"	"	1056
"											None					"	"	1057
"											"					no	no	1058
"	no							8 00			Wheelm'k's Union					yes	yes	1059
"	yes	yes					yes				" "					"	"	1060
"				?							" "					"	"	1061
"											" "					"	"	1062
"											None					"	"	1063
"											Wheelm'k's Union					"	"	1064
mo.	no										None					"	"	1065
wk.	yes	no	mort.	1,100	6	yes	yes		no	no	"					"	"	1066
"	no							6 00	"	"	"					"	"	1067
"	yes	yes					yes		yes	"	"					"	"	1068
"	"	no	cont.	600	7	yes	"		no	"	"					no	no	1069
"	"	"	"	400	8	"	"		yes	"	K. of L.	no	no	no	yes	yes	yes	1070
"	"	"	mort.	400	8	"	"		no	"	None					"	"	1071
"									"	"	"					"	"	1072
"	no							5 00	"	"	"					"	"	1073
"									yes	yes	"					"	"	1074
"	no							3 50	"	no	"					"	"	1075
"	"							6 00	"	"	"					"	"	1076
"									no	"	"					"	"	1077
"	no							7 00	yes	"	"					"	"	1078
"									no	"	"					"	no	1079
"	no							8 00	"	yes	"					"	yes	1080
"	"							6 00	"	"	"					"	"	1081
"	"							7 00	yes	no	K. of L.	no	no	no	yes	no	no	1082
"	"							4 25	no	"	None					yes	yes	1083
"	"							5 00	"	"	"					"	"	1084
"									yes	"	"					no	"	1085
"	no							7 00	no	"	"					yes	"	1086
"	"								"	"	"					"	"	1087
"									yes	"	"					"	no	1088
"									"	"	"					"	yes	1089
"									no	"	"					"	"	1090
"									"	"	"					"	"	1091
"	yes	yes					yes		"	"	"					"	"	1092
"	no							8 00	"	"	B. of B. M.	no	no	no	yes	"	"	1093
"	"							7 00	"	"	None					"	"	1094
"	yes	no	mort.	600	8	yes	yes		yes	"	"					"	"	1095
"	"	"	"	450	7	"	"		"	"	"					"	"	1096
s-mo.									no	"	"					"	"	1097
"	yes	yes					yes		yes	"	I. A. of M.	yes	yes	yes	yes	"	no	1098
"	no							6 00	"	"	Metal Pol. Union	no	no	"	no	"	yes	1099
"									"	"	B. of B. M.	"	"	"	yes	"	"	1100

Book No. 23.

Table No. 1.—Continued.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1101	G'd Rapids.	28	Am.	----	s	--	--	Machine man	day	10	yes	$1 25	130	Lack of work	$268	none
1102	"	27	Hol.	24	m	2	2	"	"	10	"	2 50	none	....	880	$150
1103	"	20	Ger.	15	s	--	--	"	"	10	"	1 25	"	....	440	50
1104	"	17	Hol.	14	"	--	--	"	"	10	"	75	52	Lack of work	225	none
1105	"	38	Am	----	m	2	5	"	"	10	"	1 60	26	" "	522	"
1106	"	21	"	----	s	--	--	"	"	----	"	1 70	5	Pleasure	590	50
1107	"	24	Ger.	11	m	2	--	"	"	10	"	1 75	52	Lack of work	525	none
1108	"	32	Am.	----	"	2	1	"	"	10	"	2 25	none	....	792	100
1109	"	35	"	----	s	--	--	"	"	10	"	2 50	60	Pleasure	730	100
1110	"	24	"	----	"	--	--	"	"	10	"	1 50	none	....	513	none
1111	"	20	"	----	"	--	--	"	"	10	"	1 35	208	Lack of work	229	"
1112	"	52	Ger.	15	m	2	6	"	"	10	"	1 25	78	Sickness......	343	"
1113	"	29	Am.	----	"	2	2	"	"	10	"	1 25	110	Lack of work	254	"
1114	"	17	"	----	s	--	--	"	"	10	"	75	104	" "	186	"
1115	"	43	"	----	m	2	5	"	"	10	"	2 25	none	....	792	"
1116	"	16	Ger.	15	s	--	--	"	"	10	"	60	52	Lack of work*	180	"
1117	"	51	"	26	m	2	9	"	"	10	"	1 25	78	" "	343	"
1118	"	20	Hol.	12	s	--	--	"	"	10	"	1 25	52	" "	375	"
1119	"	18	"	4	"	--	--	"	"	10	"	1 25	66	" "	309	"
1120	"	39	Am.	----	"	--		"	"	10	"	2 25	104	Pleasure	470	"
1121	"	18	"	----	"	--	--	"	"	10	no	83	156	Lack of work	130	"
1122	"	19	"	----	"		--	"	"	10	"	70	78	" "*	165	"
1123	"	19	"	----	"			"	"	10	yes	1 00	60	" "	253	"
1124	"	33	Can.	----	m	2	2	"	"	10	"	1 90	6	Pleasure	583	"
1125	"	58	Ger.	42	"	2	5	"	"	10	"	2 00	156	Sickness.	314	"
1126	"	24	Fin.	3	s		--	"	"	10	"	1 50	none	....	470	"
1127	"	22	Am.	----	m	2	--	"	"	10	"	1 50	26	Lack of work†	430	"
1128	"	40	"	----	"	2	1	"	"	10	"	2 00	none	....	626	100
1129	"	21	"	----	s	--	--	"	"	10	"	2 00	65	Lack of work	498	none
1130	"	27	"	----	m	2	--	"	pc.	----	"	3 50	20	Pleasure	1,134	500
1131	"	18	"	----	s	--	--	"	"	10	"	1 80	6	"	608	none
1132	"	25	"	----	"	--	--	"	"	10	"	1 85	104	Lack of work	444	"
1133	"	36	Can.	3	m	2	1	"	day	10	"	2 00	none	....	704	"
1134	"	24	Am.	----	s	--	--	"	"	10	"	1 75	12	Lack of work	595	350
1135	"	21	"	----	"	--	--	"	pc.	10	"	2 00	18	Pleasure	652	none
1136	"	21	"	--	"	--	--	"	day	10	"	1 85	26	" †	603	150
1137	"	28	Can	5	m	2	1	"	"	10	"	2 00	none	....	704	200
1138	"	44	"	12	"	2	3	"	"	----	"	1 75	104	Other business	434	none
1139	"	50	Ger.	35	s		--	"	"	10	"	2 00	26	Lack of work	652	300
1140	"	24	Am.	----	"	--	--	"	"	10	"	2 75	8	Pleasure	946	25
1141	"	20	"	----	"	--	--	"	"	10	"	2 25	none	....	792	none
1142	"	21	Hol.	12	"	--	--	"	"	10	"	1 15	"	....	405	"
1143	"	34	Am.	----	m	2	4	"	"	10	"	3 00	6	Pleasure	1,038	350
1144	"	29	"	----	"	2	1	"	"	10	no	2 50	none	....	783	100
1145	"	37	Fin.	12	"	2	3	"	"	10	"	2 50	78	Lack of work	529	none
1146	"	21	Ger.	14	"	2	--	"	pc.	10	yes	2 20	156	" "	414	"
1147	"	19	"	15	s	--	--	"	"	10	"	1 75	12	" "	581	50
1148	"	39	Am.	----	m	2	3	"	day	10	no	1 75	none	....	548	none
1149	"	24	"	----	"	2	1	"	pc.	10	"	2 15	104	Lack of work	449	"
1150	"	21	"	----	s	--		"	day	10	"	1 50	30	" "	424	50

* And pleasure.
† And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.									yes	no	None					yes	yes	1101
"	yes	no	cont.	$600	7	yes	no		no	"	I. A. of M.	yes	yes	yes	yes	"	no	1102
"											B. of B. M.	no	no	no	"	"	yes	1103
"									no	no	None					"	"	1104
"	no							$5 00	yes	"	"					"	"	1105
"									no	"	B. of B. M.	no	no	no	yes	"	"	1106
"	no							4 50	yes	"	None					"	"	1107
"	"							6 50	no	"	I. A. of M.	yes	yes	yes	yes	"	"	1108
"									yes	"	"	"	"	"	"	"	no	1109
"									no	"	None					"	yes	1110
"									"	"	"					"	"	1111
"	no							4 00	"	"	B. of B. M.	no	no	no	yes	"	"	1112
"	"							5 00	"	"	None					"	"	1113
"									"	"	"					"	"	1114
"	yes	no	mort.	225	8	yes	yes		yes	"	B. of B. M.	no	no	no	yes	"	"	1115
"									no	"	None					"	"	1116
"	yes	no	mort.	1,000	6½	yes	yes		"	"	"					"	"	1117
"									"	"	"					"	"	1118
wk.									"	"	"					"	no	1119
"									yes	"	B. of B. M	no	no	no	yes	"	yes	1120
"									"	"	None					"	"	1121
"									no	"	"					"	no	1122
"									"	"	"					"	yes	1123
"	no							5 50	ye-	yes	"					"	"	1124
"	yes	yes					yes		"	"	"					"	no	1125
"									no	no	"					"	yes	1126
"	yes	no	mort.	200	6	yes	yes		"	"	"					"	"	1127
"	no							7 00	yes	yes	"					"	"	1128
"									no	no	"					"	"	1129
s-mo.	no							5 00	"	"	B. of B. M.	no	no	no	yes	"	"	1130
"									"	"	"	"	"	"	"	"	"	1131
"									"	"	None					"	"	1132
"	no							9 00	yes	"	B. & M. I. Union	no	no	yes	yes	"	"	1133
"	yes	yes					yes		no	"	None					"	"	1134
"									yes	"	B. of B. M.	no	no	no	yes	"	"	1135
"									no	"	"	"	"	"	"	"	"	1136
"	no							7 00	"	"	None					"	"	1137
"	"							8 00	yes	"	"					"	"	1138
"									no	"	"					no	no	1139
"									"	"	I. of A. M.	yes	yes	yes	yes	yes	yes	1140
"									"	yes	"	"	"	"	"	"	"	1141
"									"	no	None					"	"	1142
"	yes	no	mort.	600	7	yes	yes		yes	"	I. of A. M.	yes	yes	yes	yes	"	"	1143
"	no							6 00	no	"	"	"	"	"	"	"	"	1144
"	yes	no	mort.	2,200	7	yes	no		"	"	"	"	"	"	"	"	"	1145
"	no							6 00	"	"	B. of B. M.	no	no	no	"	"	"	1146
"									"	"	None					"	"	1147
"	no							7 00	yes	"	B. of B. M.	no	no	no	yes	"	"	1148
"	"							7 00	no	"	None					"	"	1149
"									"	"	"					"	"	1150

Book No. 24. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1151	G'd Rapids	21	Am.	----	s		--	Machine man	day	---	no	$1 85	24	Lack of work	$535	$25
1152	"	26	"	---	"		--	"	"	10	yes	2 25	130	" "	500	100
1153	"	30	Can	18	m	2	1	"	"	10	no	1 50	26	" "	430	none
1154	"	36	Am.	----	"	--	--	"	"	10	"	2 25	156	" "	353	"
1155	"	21	Hol.	4	"	--	--	"	"	10	"	1 85	36	Pleasure-----	512	100
1156	"	32	Am.	----	m	2	3	"	"	10	"	2 75	6	Lack of work	844	none
1157	"	27	"	----	"	2	1	"	pc.	10	"	2 25	78	" "	529	"
1158	"	26	"	----	s	--	--	"	day	10	"	2 50	none	----------------	783	"
1159	"	28	"	--	w	1	3	"	"	10	"	2 75	"	----------------	861	"
1160	"	29	"	----	m	2	--	"	"	10	yes	1 50	"	----------------	470	"
1161	"	32	"	----	"	2	1	"	"	10	"	1 25	156	Lack of work	196	"
1162	"	23	"	----	s	--	--	"	"	10	"	1 25	156	" "	196	"
1163	"	20	"	----	"	--	--	"	"	10	no	1 00	52	" "	261	"
1164	"	23	"	----	m	2	--	"	"	10	"	1 50	104	Pleasure*----	313	"
1165	"	18	"	----	s	--	--	"	"	10	yes	70	18	Sickness*----	207	"
1166	"	23	"	----	"	--	--	"	"	10	no	2 00	10	Lack of work	606	125
1167	"	42	"	----	m	2	2	"	"	10	yes	2 50	none	----------------	782	350
1168	"	28	Can.	10	"	2	2	"	"	10	"	1 75	160	Lack of work	284	none
1169	"	20	Am.	----	s	--	--	"	"	10	"	1 25	130	" "	242	"
1170	"	25	"	----	"	--	--	"	"	10	"	1 25	25	Pleasure-----	475	100
1171	"	26	"	----	m	2	--	"	"	10	"	1 25	78	Sickness*----	308	none
1172	"	31	"	----	s	--	--	"	"	10	"	1 25	78	" ----	305	50
1173	"	21	"	----	"	--	--	"	"	10	"	1 25	26	Lack of work	372	50
1174	"	27	"	----	"	--	--	"	"	10	"	2 25	6	Pleasure-----	716	180
1175	"	17	Hol.	14	"	--	--	"	wk	10	"	85	94	Lack of work	255	none
1176	"	33	Am.	----	m	2	1	"	day	10	"	1 25	104	" "	275	"
1177	"	36	"	----	s	--	--	"	"	10	"	2 50	none	----------------	810	"
1178	"	39	"	----	m	2	2	"	"	10	"	2 00	54	Lack of work	540	"
1179	"	28	Hol	16	"	2	3	"	"	10	"	1 50	104	Sickness*----	330	"
1180	"	28	Pol	25	s	--	--	"	"	10	"	2 25	12	" ----	702	"
1181	"	22	Am.	----	"	--	--	"	"	10	"	2 00	none	----------------	650	70
1182	"	23	Ger.	6	m	2	--	"	"	10	"	2 00	104	Lack of work	418	none
1183	"	19	Am.	----	s	--	--	"	"	10	"	1 75	52	" "	470	"
1184	"	21	"	----	"	--	--	"	"	10	"	2 25	52	Sickness-----	612	"
1185	"	35	Hol.	28	m	2	4	"	"	10	"	1 00	286	Lack of work	27	"
1186	"	22	"	3	s		--	"	"	10	no	1 25	234	" "	99	"
1187	"	30	Scot.	21	m	2	3	"	"	10	yes	2 35	104	" "	591	"
1188	"	22	Am.	----	s	--	--	"	"	10	no	2 00	18	Pleasure-----	590	"
1189	"	23	Ger.	6	m	2	2	"	"	10	yes	2 00	78	Lack of work	470	"
1190	"	23	Am.	----	"	2	--	"	"	10	"	1 75	10	Sickness*----	532	75
1191	"	54	"	----	"	2	3	"	"	10	no	1 50	104	Lack of work	313	none
1192	"	26	"	---	"	2	--	"	"	10	"	1 50	78	" "	353	"
1193	"	33	"	----	"	2	1	"	"	10	"	1 33	78	" "	313	"
1194	"	60	"	---	"	2	1	"	"	10	"	1 50	104	" "	314	"
1195	"	30	"	---	"	2	3	"	"	10	"	1 70	104	" "	355	"
1196	"	23	Hol.	7	s	--	--	"	pc.	10	"	1 33	52	" "	347	"
1197	"	31	Ger.	14	m	2	2	"	day	10	"	1 50	36	" "	416	"
1198	"	30	"	4	"	2	1	"	"	10	"	1 25	78	" "	294	"
1199	"	22	Hol	16	s			"	"	10	"	90	42	" "	244	"
1200	"	36	Swe.	24	m	2	4	"	"	10	"	1 20	78	" "	282	"

* And lack of work.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.									no	no	B. of B. M.	no	no	no	yes	yes	yes	1151
"									"	"	I. A. of M.	yes	yes	yes	"	"	"	1152
"	no							$9 00	yes	"	None					"	"	1153
"									no	"	"					"	"	1154
"									"	"	"					"	"	1155
"	no							8 00	yes	"	I. A. of M.	yes	yes	yes	yes	"	"	1156
"	yes	no	cont.	$550	7	yes	yes		no	"	None					"	no	1157
"									"	"	I. A. of M.	yes	yes	yes	yes	"	yes	1158
"	no								"	"	"	"	"	"	"	"	"	1159
wk.	"							6 00	yes	"	None					"	"	1160
"	"							12 00	no	"	M. Woodw'k'rs U.	no	no	no	yes	"	"	1161
"									"	"	None					"	"	1162
"									"	"	"					"	"	1163
"	no							5 00	"	"	"					"	"	1164
"									"	"	"					"	"	1165
"									"	"	I. A. of M.	yes	yes	yes	yes	"	"	1166
"	yes	no	cont.	2,500	7	yes	yes		yes	"	None					"	"	1167
"	no							4 50	"	yes	"					"	"	1168
"									no	no	"					"	"	1169
"									"	"	"					"	"	1170
"	no							10 00	yes	"	"					"	"	1171
"									no	"	"					"	"	1172
"											"					"	"	1173
"									yes	no	"					"	"	1174
"									no	"	"					"	"	1175
"	no							8 00	yes	"	"					"	"	1176
"	yes	no	mort.	400	7	yes	yes		no	"	"					"	no	1177
"	no							5 00	yes	"	"					"	yes	1178
"	"							6 00	no	"	"					"	"	1179
"									"	"	I. A. of M.	yes	yes	yes	yes	"	"	1180
"									"	"	"	"	"	"	"	"	"	1181
"	no							8 00	"	"	B. of B. M.	no	no	no	no	"	"	1182
"									"	"	"	"	"	"	yes	"	"	1183
"									yes	"	"	"	"	yes	"	"	"	1184
"	no							5 00	no	yes	None					"	"	1185
"									"	"	"					"	"	1186
"	yes	no	mort.	800	7	yes	yes		yes	"	I. A. of M.	yes	yes	yes	yes	"	"	1187
"									no	"	B. of B. M.	no	no	no	"	"	"	1188
"	yes	no	cont.	465	7	yes	yes		yes	"	I. A. of M.	yes	yes	yes	"	"	"	1189
"	"	yes					"		no	"	None					"	"	1190
"	"	no	mort.	300	7	yes	"		"	"	"					no	"	1191
"	no							7 00	yes	no	"					yes	"	1192
"	"							6 00			Furn. Workers U.	no	no	no	yes	"	"	1193
"	"							5 50	yes	no	None					"	"	1194
"	yes	no	cont.	900	6	no	yes		"	"	"					"	"	1195
"									no	"	"					"	"	1196
"	yes	no	mort.	500	7	yes	yes		"	"	"					"	"	1197
"	no							4 00	"	"	"					"	"	1198
"									"	"	"					"	"	1199
"	yes	no	cont.	400	8	yes	yes		"	"	"					"	"	1200

Book No. 25. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1201	G'd Rapids.	27	Am.	----	m	2	--	Machine man	day	10	no	$1 25	18	Lack of work	$369	none
1202	"	37	Hol.	10	"	2	3	"	"	10	"	1 20	78	" "	282	"
1203	"	29	Ger.	8	"	2	1	"	"	10	"	1 30	52	" "	389	"
1204	"	58	Hol.	14	s	--	--	"	"	10	"	1 05	78	" "	247	"
1205	"	27	Am.	----	m	2	1	"	"	10	"	1 25	78	" "	294	"
1206	"	31	Hol.	5	"	2	4	"	"	10	"	1 25	42	" "	339	"
1207	"	19	Am.	----	s	--	--	"	"	10	"	1 75	78	" "	176	"
1208	"	43	"	----	"	--	--	"	"	10	"	1 50	48	Pleasure -----	398	"
1209	"	46	"	----	m	2	3	"	"	10	"	2 00	none	----------------	626	$150
1210	"	42	"	----	"	2	--	"	"	10	"	1 30	78	Lack of work	305	none
1211	"	46	"	----	"	2	1	"	"	10	"	1 75	36	" "	485	"
1212	"	30	"	----	s	--	--	"	"	10	"	1 40	52	Sickness* ----	365	"
1213	"	47	Fr.	46	m	2	5	"	"	10	"	2 00	36	Lack of work	554	"
1214	"	21	Am.	----	s	--	--	"	"	10	"	1 50	78	" "	353	"
1215	"	36	Hol.	15	m	2	3	"	"	10	"	1 62	78	" "	381	"
1216	"	39	Am.	----	s	--	--	"	"	10	----	1 40	52	Pleasure -----	365	"
1217	"	70	Ger.	24	m	2	--	"	"	10	no	1 00	78	Lack of work	›85	"
1218	"	20	Hol.	6	s	--	--	"	"	10	"	1 50	78	" "	353	"
1219	"	22	Am.	----	"	--	--	"	"	10	yes	2 25	52	" "	603	"
1220	Jackson ----	20	"	----	"	--	--	"	"	10	no	1 00	30	" "	283	"
1221	" ----	25	"	----	w	1	1	"	"	10	"	1 25	none	----------------	391	"
1222	" ----	56	Ger.	37	s	--	--	"	"	10	"	1 50	60	Lack of work	380	------
1223	" ----	37	Irish	----	m	2	4	"	"	10	"	1 50	120	" "	290	------
1224	" ----	34	Am.	----	"	2	3	"	"	10	"	1 75	30	" "	495	------
1225	" ----	45	"	----	"	2	2	"	"	10	"	1 75	30	" "	495	------
1226	" ----	15	"	----	s	--	--	"	"	10	yes	60	3	Vacation ----	186	20
1227	" ----	32	"	---	m	2	--	"	"	10	"	1 50	60	" *--	379	75
1228	" ----	46	"	----	"	2	2	"	"	10	"	1 65	20	Lack of work	483	none
1229	" ----	16	"	----	s	--	--	"	"	10	"	65	60	Vacation *---	164	19
1230	" ----	20	"	----	"	--	--	"	"	10	"	1 00	25	" *---	288	20
1231	" ----	22	"	----	"	--	--	"	"	10	no	1 50	65	Lack of work	372	none
1232	" ----	16	"	----	"	--	--	"	"	10	"	75	12	Sickness* -----	226	"
1233	" ----	17	"	----	"	--	--	"	"	10	yes	1 00	30	" *----	283	25
1234	" ----	16	"	----	"	--	--	"	"	10	"	65	20	Holidays* ----	190	42
1235	" ----	22	"	----	"	--	--	"	"	10	"	1 10	40	Sickness -----	300	none
1236	" ----	33	"	----	m		--	"	"	10	"	1 50	100	Lack of work	320	"
1237	" ----	17	"	----	s	--	--	"	"	10	no	75	15	Vacation *---	224	"
1238	" ----	23	"	---	"	--	--	"	"	10	"	1 00	100	" *---	213	"
1239	" ----	17	"	----	"	--	--	"	"	10	"	75	100	" *--	160	"
1240	" ----	23	Eng.	18	"	--	--	"	pc.	10	"	1 50	20	" *---	440	75
1241	" ----	19	Am.	----	"	--	--	"	day	10	"	75	15	" *---	223	15
1242	" ----	17	"	----	"	--	--	"	"	10	"	75	35	" *-	209	none
1243	" ----	25	"	----	m	2	1	"	"	10	yes	1 50	180	Lack of work	200	"
1244	" ----	18	"	----	s	--	--	"	"	10	no	75	40	" "	204	70
1245	" ----	23	"	----	m	2	2	"	"	10	yes	1 25	100	" "	266	none
1246	" ----	35	Irish	----	w	1	2	"	"	10	"	1 25	100	" "	266	"
1247	" ----	21	Ger.	---	s	--	--	"	"	10	"	1 25	30	" "	354	"
1248	" ----	23	Am.	----	"	--	--	"	"	10	"	1 25	5	Holidays ----	385	"
1249	" ----	20	"	----	"	--	--	"	"	10	"	90	150	Lack of work	147	"
1250	" ----	18	"	----	"	--	--	"	"	10	"	1 00	90	Vacation *---	228	"

* And lack of work.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance.	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	no								no	no	None					yes	yes	1201
"	yes	no	cont.	$600	7	yes	yes		"	"	"					"	"	1202
"	"	"	mort.	400	7	"	"		yes	"	"					"	"	1203
"									no	"	"					"	"	1204
"	no							$6 00	yes	"	"					"	"	1205
"	"							4 50	no	"	"					"	"	1206
"									"	"	"					"	"	1207
"									"	"	"					"	"	1208
"	no							8 00	yes	"	"					"	"	1209
"	yes	no	mort.	150	7	yes	yes		no	"	"					"	"	1210
"	"	"	"	200	7	"	"		yes	"	"					"	"	1211
"									no	"	"					"	"	1212
"	yes	yes					yes		yes	"	"					"	"	1213
"									no	"	"					"	no	1214
"	no							5 00	"	"	"					"	yes	1215
"									yes	"	"					"	"	1216
"	yes	yes					yes		no	"	"					"	"	1217
"									"	yes	B. of B. M.	no	no	no	yes	"	"	1218
"									"	"	"	"	"	"	"	"	"	1219
s-mo.											None							1220
"											"							1221
"											"					yes	no	1222
"	yes	no	mort.	200	7	yes	yes				"					"	"	1223
"	no							9 00	yes	yes	"					"	yes	1224
"	"							10 00	"	"	"					"	"	1225
wk.									no	no	"					"	no	1226
"	no							8 00	"	"	I. A. of M.	no	yes	yes	yes	"	yes	1227
"	yes	no	mort.	200	7	yes	yes		"	"	None					no	no	1228
"									"	"	"					yes	yes	1229
"									yes	"	"					no	no	1230
"									no	"	"					"	yes	1231
"									"	"	"					yes	"	1232
"											"					no	no	1233
"											"					"	"	1234
"									no	no	"					"	"	1235
"	no							4 00			"					"	"	1236
"									yes	no	"					yes	"	1237
"									no	"	"					"	yes	1238
"									"	"	"					no	no	1239
"	no							7 00	yes	"	"					yes	yes	1240
"									no	"	"					no	no	1241
"									"	"	"					yes	"	1242
"	no							7 00	"	"	"					"	yes	1243
"									"	"	"					no	"	1244
"	yes	no	mort.	450	7	yes	yes		"	"	"					yes	"	1245
"	no								"	"	"					no	"	1246
"	yes	yes					yes		"	"	"					yes	"	1247
"									"	"	"					"	no	1248
"									"	"	"					"	yes	1249
"									"	"	"					"	"	1250

Book No. 26. **Table No. 1.—CONTINUED.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1251	Jackson ----	20	Am.	----	s	--	--	**Machine man**	day	10	yes	$1 25	100	Lack of work*	$268	none
1252	" ----	19	"	----	"	--	--	"	"	10	"	65	125	" "	122	"
1253	" ----	26	"	----	m	2	1	"	"	10	no	1 75	13	Sickness ----	525	"
1254	" ----	23	Ger.	----	s	--	--	"	"	10	"	1 25	none	----	391	"
1255	" ----	28	Scot	21	"	--	--	"	"	10	"	1 25	"	----	391	"
1256	" ----	25	Am.	----	m	2	1	"	"	10	"	1 25	"	----	391	"
1257	" ----	31	"	----	"	2	--	"	"	10	"	1 50	"	----	470	"
1258	" ----	31	"	----	"	2	--	"	"	10	yes	2 25	3	Sickness ----	698	$300
1259	" ----	24	"	----	s	--	--	"	"	10	"	2 00	30	Lack of work	566	none
1260	" ----	29	Irish	----	m	2	1	"	"	10	no	1 75	none	----	548	"
1261	" ----	39	Am.	----	"	2	1	"	"	10	"	1 50	10	Lack of work	455	50
1262	" ----	29	Ger.	----	"	2	1	"	"	10	"	1 25	25	" "	360	none
1263	" ----	35	Am.	----	"	2	1	"	"	10	"	1 25	none	----	391	50
1264	" ----	39	"	----	"	2	2	"	"	10	"	1 25	15	Lack of work	375	none
1265	" ----	29	"	----	"	2	--	"	"	10	"	1 50	30	Sickness† ----	425	25
1266	" ----	39	"		"	2	2	"	"	10	"	1 50	10	Lack of work	455	none
1267	" ----	21	"	----	"	2	1	"	"	10	"	1 00	none	----	313	"
1268	" ----	55	"	----	"	3	2	"	"	10	"	1 50	"	----	470	"
1269	" ----	35	"	----	"	2	--	"	"	10	"	1 50	20	Lack of work	440	"
1270	" ----	40	"	----	"	2	--	"	"	10	"	1 50	none	----	470	"
1271	" ----	30	"	----	"	2	1	"	"	10	"	1 25	"	----	391	"
1272	" ----	37	"	----	"	2	3	"	"	10	"	1 65	"	----	516	"
1273	" ----	20	"	----	s	--	--	"	"	10	"	1 25	"	----	391	75
1274	" ----	38	"	----	m	2	3	"	"	10	yes	2 25	6	Lack of work	691	52
1275	" ----	26	"	----	s	--	--	"	pc.	10	"	1 50	25	Sickness ----	432	none
1276	Detroit ----	20	Ger.	----	"	--	--	"	day	10	no	90	none	----	282	----
1277	" ----	20	"	----	"	--	--	"	"	10	yes	1 00	10	Holidays ----	303	none
1278	" ----	25	Can.	23	m	2	--	"	"	10	"	2 00	78	Lack of work	500	50
1279	" ----	22	"	15	s	--	--	"	"	10	no	1 50	235	" "	117	none
1280	" ----	21	Am.	----	"	--	--	"	"	10	yes	2 00	10	Pleasure ----	606	50
1281	" ----	29	Ger.	15	m	2	--	"	"	10	"	1 75	none	----	600	200
1282	" ----	32	Am.	----	s	--	--	"	"	10	no	2 00	52	Sickness ----	522	100
1283	" ----	25	"	----	"	--	--	"	"	10	"	1 75	104	Lack of work	366	100
1284	" ----	16	"	----	"	--	--	"	"	10	yes	75	104	" "	157	----
1285	" ----	22	"	----	"	--	--	"	"	10	no	2 00	none	----	626	100
1286	" ----	19	"	----	"	--	--	"	"	10	yes	1 50	14	Pleasure ----	450	50
1287	" ----	24	Irish	9	"	--	--	"	"	10	no	1 50	130	Lack of work	275	none
1288	" ----	22	Am.	----	"	--	--	"	"	10	"	2 25	12	Pleasure ----	677	200
1289	" ----	21	"	----	"	--	--	"	"	10	"	1 75	14	" ----	523	150
1290	" ----	20	Can.	1	"	--	--	"	"	10	"	1 50	52	Lack of work	391	none
1291	" ----	62	Am.	----	m	2	--	"	"	10	"	2 00	none	----	626	"
1292	" ----	23	"	----	s	--	--	"	pc.	10	yes	1 50	"	----	470	"
1293	" ----	17	"	----	"	--	--	"	day	10	"	66	"	----	209	"
1294	" ----	22	Can.	8	"	--		"	"	10	"	1 50	"	----	470	"
1295	" ----	22	Am.	----	"	--	--	"	"	10	"	1 25	"	----	391	50
1296	" ----	27	Eng.	22	m	2	--	"	"	10	"	1 35	"	----	423	none
1297	" ----	30	Ger.	29	s	--	--	"	"	10	no	1 62	90	Lack of work	361	"
1298	" ----	66	"	47	m	3	--	"	"	10	"	2 00	30	" "	560	"
1299	" ----	46	------	----	"	2	4	"	hr.	10	"	1 25	none	----	391	"
1300	" ----	28	Am.	----	s	--	--	"	day	10	"	1 25	"	----	391	90

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* And holidays.
† And pleasure.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.									no	no	None					no	no	1251
"									"	"	"					"	"	1252
"	yes	no	cont.	$50	7	yes	yes		"	"	"					yes	yes	1253
"									"	"	"					"	"	1254
"									yes	"	"					"	"	1255
"	no							$5 00	"	"	"					"	"	1256
"	"							9 00	no	"	"					"	"	1257
"	"							10 00		yes	"					"	no	1258
"									yes	"	"					"	yes	1259
"	no							7 00	no	no	"					"	"	1260
"	"							7 00	"	"	"					"	"	1261
"	yes	yes					yes		yes	"	"					"	"	1262
"	"	no	mort.	350	7	yes	"		"	"	"					"	"	1263
"	"	yes					"		no	"	"					"	"	1264
"	no							8 00	"	"	"					"	"	1265
"	"							7 00	"	"	"					"	"	1266
"	"							5 00	"	"	"					"	"	1267
"	yes	no	mort	200	8	yes	yes		yes	"	"					"	"	1268
"	no							8 50	"	"	"					"	"	1269
"	yes	yes					yes		"	"	"					"	"	1270
"	no							7 00	"	"	"					"	"	1271
"	yes	no	mort.	225	7	yes	yes		"	"	"					"	"	1272
"									no	"	"					"	"	1273
"	yes	no	mort.	450	7	yes	yes		yes	"	"					"	no	1274
"									"	"	"					"	yes	1275
s-mo.											"					"	"	1276
"											"					"	"	1277
wk.	no										Brass Workers U.	no	no	yes	yes	"		1278
"											None					"		1279
"											"					"		1280
"	yes	yes					yes				"					"		1281
"											Brass Workers U.	yes	yes	yes	yes	"		1282
"											None					"		1283
"											"					no		1284
"											"					yes		1285
"											"					"		1286
"											"							1 87
"											"							1288
"									no	no	J. O. U. A. M.	no	no	no		yes		1289
"											None					"		1290
s-mo.	no							20 00		no	"					"	yes	1291
"									yes	yes	"					"	"	1292
"									no	no	"					"	"	1293
"									"	"	"					"	"	1294
"									"	"	"					"	"	1295
"	no							7 00	yes	"	"					"	"	1296
wk.									no	"	"					"	"	1297
s-mo.	yes	no	mort.	950	7				"	"	"					"	"	1298
"	no							7 00	"	"	"					no	"	1299
"									"	"	"							1300

Book No. 27. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1301	Detroit	24	Am.	----	s	--	--	Machine man	pc.	10	no	$1 25	none	----------------	$391	none
1302	"	22	"	----	"	--	--	"	"	10	"	1 25	60	Lack of work	316	"
1303	"	34	"	----	m	2	1	"	day	10	"	1 50	60	" "	380	"
1304	"	23	"	----	s	--	--	"	"	10	"	1 25	none	----------------	391	"
1305	Coldwater	29	Ger.	----	m	2	1	"	"	10	yes	1 50	30	Sickness	425	$75
1306	"	16	Am.	----	s	--	--	"	"	10	"	1 00	36	Lack of work	277	none
1307	"	32	Ger.	----	m	2	1	"	"	10	"	1 50	30	" "	425	125
1308	"	27	Am.	----	"	2	1	"	"	10	"	1 50	60	Pleasure	380	100
1309	"	19	"	----	s	--	--	"	"	10	"	1 00	60	Lack of work	258	none
1310	"	34	"	----	m	2	1	"	"	10	"	1 50	12	Pleasure*	452	100
1311	"	29	"	----	"	2	--	"	"	10	"	1 00	30	Lack of work	283	none
1312	"	19	"	----	s	--	--	"	"	10	"	1 00	30	Sickness	283	"
1313	"	38	"	--	m	2	2	"	"	10	"	1 65	12	"	497	"
1314	"	37	Irish	28	"	2	--	"	"	10	"	1 50	6	Lack of work	461	60
1315	"	19	Am.	----	s	--	--	"	"	10	"	60	6	Pleasure	184	none
1316	"	18	"	----	"	--	--	"	"	10	"	1 00	120	Lack of work	198	20
1317	"	40	"	----	"	--	--	"	"	10	"	1 50	12	Sickness	452	200
1318	"	30	"	----	m	2	2	"	"	10	"	1 25	36	Lack of work	346	50
1319	"	20	"	----	s	--	--	"	"	10	"	1 00	60	" "	258	none
1320	"	28	"	----	m	2	--	"	"	10	"	1 25	50	" "	329	"
1321	Buchanan	30	"	----	"	2	1	"	pc.	10	no	3 00	30	Various	849	------
1322	"	31	"	----	s	--	--	"	"	10	"	3 00	32	"	848	------
1323	"	32	"	----	m	2	1	"	"	10	"	3 00	34	"	837	------
1324	"	27	"	----	"	2	--	"	day	10	"	1 37	31	"	386	------
1325	"	59	"	----	w	1	2	"	"	10	"	1 75	40	"	478	------
1326	"	25	"	----	m	2	2	"	"	10	"	1 75	40	"	478	------
1327	"	23	"	----	s	--	--	"	"	10	"	1 37	31	"	386	------
1328	"	48	"	----	m	2	1	"	"	10	"	1 37	30	"	388	------
1329	"	30	"	----	"	2	1	"	pc.	10	"	2 25	33	"	690	------
1330	"	41	"	----	"	2	3	"	"	10	yes	1 25	35	"	347	------
1331	"	37	"	----	"	2	-	"	"	10	"	2 25	30	"	637	------
1332	"	29	"	----	"	2	2	"	"	10	"	2 25	33	"	690	------
1333	"	32	------	29	"	2	--	"	day	10	no	3 00	31	"	846	------
1334	"	45	Am.	----	"	2	4	"	"	10	yes	1 62	32	"	455	------
1335	Charlotte	32	"	----	"	2	2	"	wk.	10	no	1 17	90	Lack of work	260	none
1336	"	35	"	----	"	2	3	"	day	10	"	1 00	150	" "	163	"
1337	"	26	"	----	s	--	--	"	wk.	10	"	1 00	60	" "	253	"
1338	"	42	"	----	m	2	1	"	day	10	yes	1 25	60	" "	316	"
1339	"	31	"	----	"	2	2	"	"	10	no	1 00	60	" "	253	"
1340	"	22	"	----	s	--	--	"	wk.	10	yes	1 15	60	" "	290	"
1341	"	29	"	----	"	--	--	"	day	10	no	1 00	120	" "	193	"
1342	"	28	"	----	m	3	2	"	wk.	10	yes	1 00	100	" "	213	"
1343	"	24	"	----	s	--	--	"	day	10	no	1 25	60	" "	316	25
1344	"	22	"	----	"	--	--	"	"	10	"	1 25	90	" "	278	none
1345	"	45	"	----	m	2	2	"	"	10	"	1 25	60	" "	316	"
1346	Pontiac	36	"	----	s	--	--	"	"	10	"	2 00	none	----------------	626	"
1347	"	24	"	----	m	2	2	"	"	10	----	1 50	"	----------------	470	"
1348	"	25	"	----	s	--	--	"	"	10	no	1 50	21	Laid off	438	"
1349	"	24	"	----	m	2	--	"	"	10	"	1 50	none	----------------	470	50
1350	"	23	"	----	"	2	1	"	"	10	----	1 83	21	Lack of work*	534	none

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.									no	no	None					yes	yes	1301
"									"	"	"					"	"	1302
"	no							$8 00	yes	"	"					"	"	1303
"									no	"	"					"	"	1304
wk.	yes	no	mort.	$400	7	yes	yes		"	"	"					"	no	1305
"									"	"	"					"	"	1306
"	no							6 00	yes	"	"					"	"	1307
"	"							8 00	"	"	"					"	"	1308
"									no	"	"					"	"	1309
"	yes	yes					yes		"	"	"					"	"	1310
"	no							5 00	"	"	"					"	"	1311
"									"	"	"					"	"	1312
"	no							8 00			"					"	"	1313
"	"							6 50			"					"	"	1314
"											"					"	"	1315
"											"					"	"	1316
"									no	no	"					"	"	1317
"	yes	yes					yes		"	"	"					"	yes	1318
"									"	"	"					"	"	1319
"	yes	no	cont.	300	6	yes	yes		yes	"	"					"	"	1320
s-mo.	no							10 00	"		"					"	"	1321
"											"					"	"	1322
"	no										"					"	"	1323
"	"							5 00			"					"	"	1324
"	yes	yes					yes				"					"	"	1325
"	no							6 00			"					"	"	1326
"											"					"	"	1327
"	yes	no	mort.	200	7	yes	yes		yes	no	"					"	"	1328
"	no								no	yes	"					"	"	1329
"	yes	no		110		yes	no		yes	no	"					"	"	1330
"	no										"					"	"	1331
"	"							6 00	yes	no	"					"	"	1332
"	"										"					"	"	1333
"	"										"					"	"	1334
wk.	"							7 00	no	yes	"					"	no	1335
"	"							6 00	yes	"	"					"	yes	1336
"									no	no	"					"	"	1337
"	no							6 00	"	"	"					"	"	1338
"	"							7 00	"	"	"					"	"	1339
"	"							6 00	"	"	"					"	no	1340
"									"	"	"					"	yes	1341
"	no								"	"	"					"	"	1342
"									"	"	"					"	"	1343
"											"					"	no	1344
"	yes	yes					yes		no	no	"					"	yes	1345
"									"	"	"					"	"	1346
"	no							5 00	"	"	"					"	"	1347
"									"	"	"					"	no	1348
"	no							10 00	"	"	"					"	yes	1349
"	"							7 50	"	"	"					"	"	1350

Book No. 28. **Table No. 1.—CONTINUED.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1351	Pontiac ----	19	Am.	----	m	2	1	Machine man	day	10	----	$1 25	none	----	$375	none
1352	“ ----	40	“	----	“	2	3	“	“	10	----	2 00	“	----	626	“
1353	“ ----	30	Can.	8	“	2	2	“	“	10	----	1 75	“	----	548	“
1354	“ ----	38	Am.	----	“	4	2	“	“	10	no	1 25	“	----	391	“
1355	“ ----	40	“	----	“	2	--	“	“	10	“	2 25	“	----	704	“
1356	“ ----	46	Eng.	25	“	2	4	“	“	10	“	2 25	“	----	704	“
1357	“ ----	30	Am.	----	s	--	--	“	“	10	----	1 75	“	----	548	$200
1358	“ ----	28	“	----	m	2	1	“	“	10	----	1 75	“	----	548	none
1359	“ ----	39	“	----	“	2	2	“	“	10	----	2 00	“	----	626	“
1360	“ ----	32	Can.	11	“	2	3	“	“	10	no	1 50	“	----	470	----
1361	“ ----	48	Am.	----	“	5	2	“	“	10	“	1 50	“	----	470	none
1362	“ ----	28	“	----	“	2	1	“	“	10	“	1 50	“	----	470	“
1363	Lansing ----	27	“	----	s	--	--	“	“	10	“	2 25	25	Lack of work	648	200
1364	“ ----	21	Ger.	22	“	--	--	“	“	10	“	1 75	10	“ “	530	300
1365	“ ----	42	Am.	----	m	2	--	“	“	10	“	1 35	20	Sickness ----	396	25
1366	“ ----	25	“	----	s	--	--	“	“	10	“	1 25	18	Lack of work	369	none
1367	“ ----	26	“	----	m	2	1	“	“	10	“	1 50	7	Sickness ----	459	75
1368	“ ----	20	Ger.	13	s	--	--	“	“	10	“	1 20	20	Lack of work*	352	75
1369	“ ----	29	Am.	----	“	--	--	“	“	10	“	1 50	20	“ “	440	50
1370	“ ----	35	“	----	“	--	--	“	“	10	“	1 25	20	“ “	366	none
1371	“ ----	37	Ger.	----	m	2	--	“	“	10	“	1 20	20	Sickness ----	352	“
1372	“ ----	32	Am.	----	“	2	2	“	“	10	“	1 50	none	----	470	75
1373	“ ----	20	Ger.	13	“	2	--	“	“	10	“	1 25	6	Pleasure ----	384	50
1374	“ ----	18	Am.	----	s	--	--	“	“	10	“	80	10	Lack of work	242	none
1375	“ ----	21	Ger.	11	“	--	--	“	“	10	“	1 00	10	Sickness ----	303	100
1376	“ ----	38	Am.	----	m	2	3	“	“	10	“	1 25	6	“ ----	384	none
1377	“ ----	38	“	----	“	2	4	“	“	10	“	1 50	60	Lack of work	380	“
1378	“ ----	20	“	----	“	2	--	“	“	10	“	1 00	50	“ “	263	“
1379	“ ----	28	“	----	“	2	1	“	pc.	10	yes	1 75	4	Sickness ----	541	50
1380	“ ----	44	Prus.	15	“	2	1	“	day	10	“	1 50	none	----	470	50
1381	“ ----	50	Ger.	15	“	3	6	“	“	10	no	1 15	90	Lack of work	256	none
1382	“ ----	36	Can.	8	“	2	2	“	“	10	“	1 95	30	“ “	552	100
1383	“ ----	21	Am.	----	s	--	--	“	“	10	“	1 00	53	“ “	260	none
1384	“ ----	19	“	----	“	--	--	“	“	10	“	1 10	46	“ “	294	“
1385	“ ----	23	Ger.	22	m	2	--	“	“	10	“	1 35	200	“ “ *	153	“
1386	“ ----	35	Am.	----	“	2	1	“	“	10	“	1 25	90	“ “	279	“
1387	“ ----	24	“	----	s	--		“	“	10	----	1 15	60	“ “	291	“
1388	“ ----	41	“	----	m	2	1	“	“	10	no	1 50	26	“ “	431	20
1389	“ ----	34	“	----	“	2	1	“	“	10	“	1 25	40	“ “	311	----
1390	“ ----	21	“	----	“	2	1	“	pc.	10	“	1 40	75	“ “ *	333	none
1391	Lowell ----	44	Can.	11	“	2	2	“	day	10	“	1 87	100	“ “	398	“
1392	“ ----	37	Am.	----	“	2	2	“	“	10	yes	1 50	100	“ “	319	“
1393	“ ----	20	“	----	s	--		“	“	10	“	1 00	150	“ “	163	“
1394	“ ----	45	Can.	2	m	2	3	“	“	10	no	1 75	120	“ “	338	“
1395	“ ----	52	Am.	----	“	2	2	“	“	10	“	1 50	93	“ “	330	“
1396	“ ----	39	Can.	16	“	2	3	“	wk.	10	“	1 66	80	“ “	287	“
1397	“ ----	19	Am.	----	s	--	--	“	day	10	“	1 00	104	“ “	209	“
1398	“ ----	37	“	----	m	2	1	“	“	10	“	1 50	70	----	365	“
1399	“ ----	25	Eng.	----	s	--	--	“	“	10	“	1 25	156	Lack of work	196	“
1400	“ ----	22	Am.	----	“	--	--	“	“	10	“	1 00	200	“ “	113	“

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	no	----	------	------	----	----	----	$5 00	no	no	None	----	----	----	----	yes	no	1351
“	“	----	------	------	----	----	----	10 00	yes	yes	“	----	----	----	----	“	yes	1352
“	“	----	------	------	----	----	----	5 00	no	“	“	----	----	----	----	“	“	1353
“	“	----	------	------	----	----	----	5 00	----	“	“	----	----	----	----	“	“	1354
“	“	----	------	------	----	----	----	6 00	no	“	“	----	----	----	----	“	“	1355
“	“	----	------	------	----	----	----	10 00	yes	“	“	----	----	----	----	“	no	1356
“	----	----	------	------	----	----	----	------	no	“	“	----	----	----	----	“	yes	1357
“	no	----	------	------	----	----	----	7 00	“	“	“	----	----	----	----	“	“	1358
“	“	----	------	------	----	----	----	12 50	yes	no	“	----	----	----	----	“	“	1359
“	“	----	------	------	----	----	----	9 00	“	----	“	----	----	----	----	“	“	1360
“	“	----	------	------	----	----	----	8 00	“	----	“	----	----	----	----	“	“	1361
“	“	----	------	------	----	----	----	9 00	“	yes	“	----	----	----	----	“	no	1362
“	----	----	------	------	----	----	----	------	no	no	I. A. of M.	yes	yes	yes	yes	“	yes	1363
“	----	----	------	------	----	----	----	------	“	yes	None	----	----	----	----	“	“	1364
“	yes	no	mort.	$100	7	yes	yes	------	yes	no	M. Woodw'k's U'n	yes	----	----	----	“	no	1365
“	----	----	------	------	----	----	----	------	“	“	None	----	----	----	----	“	yes	1366
“	yes	no	cont.	600	7	yes	yes	------	----	“	“	----	----	----	----	“	“	1367
“	----	----	------	------	----	----	----	------	----	----	“	----	----	----	----	“	“	1368
“	----	----	------	------	----	----	----	------	----	----	“	----	----	----	----	“	“	1369
“	----	----	------	------	----	----	----	------	no	no	“	----	----	----	----	“	“	1370
“	yes	no	------	------	----	----	yes	------	----	----	“	----	----	----	----	“	“	1371
“	“	“	mort.	54	6	yes	“	------	----	no	M. Woodw'k's U'n	yes	----	----	----	“	“	1372
“	“	yes	------	------	----	----	“	------	----	----	None	----	----	----	----	no	no	1373
“	----	----	------	------	----	----	----	------	no	no	“	----	----	----	----	yes	yes	1374
“	yes	no	mort.	200	7	yes	yes	------	yes	“	“	----	----	----	----	“	“	1375
“	no	----	------	------	----	----	----	5 00	“	yes	M. Woodw'k's U'n	yes	yes	yes	yes	“	“	1376
s-mo.	“	----	------	------	----	----	----	8 00	----	“	None	----	----	----	----	“	“	1377
“	“	----	------	------	----	----	----	8 00	no	“	“	----	----	----	----	“	“	1378
wk.	yes	no	mort.	100	7	yes	yes	------	yes	no	“	----	----	----	----	“	“	1379
“	“	yes	------	------	----	----	“	------	“	yes	“	----	----	----	----	“	“	1380
s-mo.	“	“	------	------	----	----	“	------	no	no	“	----	----	----	----	no	no	1381
“	“	“	------	------	----	----	“	------	yes	yes	“	----	----	----	----	“	“	1382
“	----	----	------	------	----	----	----	------	no	no	“	----	----	----	----	yes	“	1383
“	----	----	------	------	----	----	----	------	“	“	“	----	----	----	----	no	“	1384
“	no	----	------	------	----	----	----	------	“	“	“	----	----	----	----	“	“	1385
“	“	----	------	------	----	----	----	7 00	yes	“	“	----	----	----	----	yes	yes	1386
------	----	----	------	------	----	----	----	------	no	“	“	----	----	----	----	“	“	1387
s-mo.	no	----	------	------	----	----	----	7 00	yes	“	“	----	----	----	----	“	“	1388
“	yes	yes	------	------	----	----	no	------	no	“	“	----	----	----	----	“	“	1389
“	no	----	------	------	----	----	----	6 00	----	----	“	----	----	----	----	“	no	1390
mo.	“	----	------	------	----	----	----	5 00	yes	no	“	----	----	----	----	“	yes	1391
“	“	----	------	------	----	----	----	------	“	“	“	----	----	----	----	“	“	1392
“	----	----	------	------	----	----	----	------	----	----	“	----	----	----	----	“	“	1393
“	no	----	------	------	----	----	----	4 25	yes	no	“	----	----	----	----	“	“	1394
“	yes	yes	------	------	----	----	yes	------	no	“	“	----	----	----	----	“	“	1395
“	“	“	------	------	----	----	“	------	yes	“	“	----	----	----	----	“	“	1396
“	----	----	------	------	----	----	----	------	----	----	“	----	----	----	----	no	“	1397
“	yes	----	------	------	----	----	yes	------	----	----	“	----	----	----	----	yes	“	1398
“	----	----	------	------	----	----	----	------	----	----	“	----	----	----	----	“	no	1399
“	----	----	------	------	----	----	----	------	yes	yes	“	----	----	----	----	no	yes	1400

Book No. 29.

Table No. 1.—CONTINUED.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1401	Lowell -----	33	Am.	----	m	2	4	Machine man	day	10	no	$1 00	120	Lack of work	$193	none
1402	" -----	23	"	----	s	--	--	"	"	10	"	1 75	120	" "	338	"
1403	" -----	33	"	----	m	2	3	"	"	10	"	1 58	60	" "	380	"
1404	Flint - -	23	"	----	s		--	"	pc.	10	"	1 75	60	Sickness------	443	$50
1405	" -------	21	"	----	m	2	--	"	day	10	"	1 00	30	Vacation-----	283	none
1406	" -------	26	"	----	"	2	--	"	"	10	"	1 38	30	" *----	389	"
1407	" -------	31	Can.	20	"	2	2	"	pc.	10	yes	1 50	30	" *----	425	"
1408	" -------	49	Am.	----	"	2	4	"	day	10	no	1 25	90	Lack of work	279	"
1409	" -------	41	"	----	"	2	1	"	"	10	yes	2 50	none	---------------	783	150
1410	" -------	24	"	----	"	2	--	"	"	10	"	1 67	72	Sickness -----	400	none
1411	" -------	34	Can.	15	"	2	--	"	"	10	"	2 00	144	" ----	338	10
1412	" -------	34	Ger.	28	"	2	2	"	"	10	"	2 00	none	---------------	626	150
1413	" -------	31	Can	4	"	2	2	"	"	10	"	2 00	1	---------------	624	300
1414	" -------	36	Am.	----	"	2	4	"	"	10	"	2 25	none	---------------	704	50
1415	" -------	40	"	----	"	2	1	"	"	10	"	2 50	"	---------------	783	150
1416	" -------	20	Ger.	4	s		--	"	"	10	"	1 25	14	Other work--	374	75
1417	" -------	31	Am.	----	m	2	1	"	"	10	"	2 00	14	Sickness-----	598	------
1418	" -------	23	"	----	"	2	1	"	"	10	no	1 25	18	" -----	368	none
1419	" -------	20	"	----	s	--	--	"	"	10	"	1 00	120	Lack of work	193	"
1420	Three Rivers-	30	"	----	"	--	--	"	"	9	"	1 65	10	Vacation ----	500	100
1421	" "	65	Ger.	35	m	2	2	"	"	9	"	1 50	10	Sickness-----	455	none
1422	" "	36	Am.	---	"	2	1	"	"	10	"	2 25	24	Vacation*---	650	150
1423	" "	42	"	----	"	2	3	"	"	10	"	1 88	26	Lack of work	540	none
1424	" "	41	"	----	"	2	3	"	"	10	yes	1 54	5	" "	475	"
1425	" "	19	"	----	s	--	--	"	"	10	no	1 00	20	Pleasure*----	293	------
1426	" "	26	"	----	m	2	--	"	"	10	"	1 34	90	Lack of work	299	none
1427	" "	42	"	----	"	2	1	"	"	10	"	1 60	60	Accident ----	405	75
1428	" "	32	"	----	"	2	--	"	"	10	yes	1 40	30	Lack of work	396	75
1429	" "	18	"	----	"	2	--	"	"	10	"	1 06	30	Vacation ----	300	none
1430	Wayne ----	33	Can.	8	"	2	4	"	"	10	"	1 65	30	Lack of work	467	50
1431	" -----	26	Scot.	5	s		--	"	"	10	"	1 25	60	" "	316	none
1432	" -----	25	Am.	----	m	2	1	"	"	10	no	1 50	30	" "	425	"
1433	" -----	29	"	---	"	2	1	"	"	10	yes	1 00	30	" " *	283	"
1434	" -----	22	"	----	s	--	--	"	"	10	"	1 00	60	" " *	253	"
1435	" -----	18	"	----	"	--	--	"	"	10	"	1 00	30	" " †	283	"
1436	" -----	32	"	----	m	2	2	"	"	10	"	1 75	45	" "	469	"
1437	" -----	53	"	----	"	2	2	"	"	10	"	1 25	30	" "	354	"
1438	" -----	30	"	----	"	2	1	"	"	10	"	1 25	40	" "	341	"
1439	" -----	35	"	----	"	2	1	"	"	10	no	1 25	10	" "	376	"
1440	" -----	21	"	---	s	--	--	"	"	10	"	1 00	156	" "	157	"
1441	" ----	28	"	----	m	2	1	"	"	10	"	2 00	30	Accident ----	566	50
1442	West Bay City	25	"	--	"	2	1	"	"	10	"	1 50	36	Sickness-----	415	none
1443	Bay City----	16	Pol.	12	s		--	"	"	10	yes	1 00	5	" -----	308	100
1444	" " ----	30	Am.	--	m	2	2	"	"	10	no	2 75	15	Vacation ----	820	none
1445	" " ----	33	Can.	24	s	--	--	"	"	10	yes	2 50	10	" ----	708	450
1446	" " ---	20	Am.	----	"	--	--	"	pc.	10	"	1 75	10	" ----	530	100
1447	" " ---	20	"	----	"	--	--	"	day	10	no	1 50	12	" *---	452	250
1448	" " ----	18	"	----	"		--	"	"	10	yes	80	30	Lack of work	226	10
1449	" " ----	20	"	---	"	-	--	"	"	10	no	1 00	20	Sickness--	293	25
1450	" " ----	33	Ger.	16	m	2	1	"	pc.	10	yes	1 75	15	Lack of work	522	none

* And sickness.
† And pleasure.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
mo.	yes						yes		yes	no	None					yes	yes	1401
"									"		"					"	"	1402
"	no							$4 00	"	no	"					"	"	1403
wk.									"	yes	"					no	no	1404
s-mo.	no							5 00	"	no	"					yes	yes	1405
"	yes	no	mort.	$500	7	yes	yes		"	yes	"					"	"	1406
"	no							6 00	"	no	"					"	"	1407
wk.	"							7 00	"	"	"					"	"	1408
"	yes	no	cont.	200	8	yes	yes		"	yes	"					"	no	1409
"	no							6 00	"	"	"					"	yes	1410
"	"								no	no	"					"	"	1411
"	yes	yes							yes		"					"	"	1412
"	no							4 00	"		"					"	"	1413
"	ye	no	mort.	150	8	yes	yes		"	yes	"					"	"	1414
"	"	yes							"	"	"					"	"	1415
"											"					no	no	1416
"	no							6 00	yes	no	"					yes	yes	1417
"	"							5 00		"	"					"	"	1418
"									yes	"	"					"	"	1419
"									"	yes	"					no	no	1420
"	yes	yes					yes		"	no	"					yes	yes	1421
"	"	"					"		"	"	"					"	"	1422
"	no							7 00	no	"	"					"	"	1423
"	yes	no	mort.	600	7	yes	yes		yes	"	"					"	"	1424
"											"							1425
"	no							12 00		yes	"					yes	yes	1426
"	yes	yes					yes		yes	"	"					"	"	1427
"	"	no	mort.	425	6	yes	"		"	no	"					"	"	1428
"	no								no	"	"					no	yes	1429
s-mo	"							6 00			"					yes	"	1430
"	yes										"					"	"	1431
"	no							5 00			"					"	"	1432
"	"							5 00			"					"	"	1433
"											"					"	"	1434
"											"					"	"	1435
"	no							3 00	yes		"					"	"	1436
"	"							5 00			"					"	"	1437
"	"							6 00			"					"	"	1438
"	"							5 00			"					"	"	1439
"											"					"	"	1440
"	no							7 00			"					"	"	1441
wk.	"							7 00	no		B. of B. M.	no		no	no	"	"	1442
"									"	no	None					"	"	1443
"	no							10 00	yes	"	B. of B. M.	no	no	no	no	"	"	1444
"	yes	yes					yes		no	"	None					"	"	1445
"									"	"	B. of B. M.	no	no	no	yes	"	"	1446
"									"	"	None					"	"	1447
"									"	"	"					"	"	1448
"									"	"	B. of B. M.	no	no	no	no	"	"	1449
"	no							8 00	yes	"	"	"	"	"	yes	"	"	1450

Book No. 30. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1451	Bay City	20	Am.	----	s	--	--	Machine man	pc.	10	yes	$1 50	20	Vacation	$440	$100
1452	" "	22	"	----	"	--	--	"	day	10	"	1 50	40	Lack of work	410	none
1453	Ionia	24	"	----	"	--	--	"	"	10	no	1 15	60	" "	291	25
1454	"	28	"	----	"	--	--	"	"	10	"	1 25	60	----------------	316	50
1455	"	66	"	----	m	7	--	"	"	10	"	1 35	60	Lack of work	342	none
1456	"	31	"	----	"	2	2	"	"	10	"	1 60	60	" "	405	"
1457	"	31	"	----	"	2	--	"	"	10	"	1 75	104	Sickness	366	"
1458	"	48	"	----	"	2	7	"	"	10	"	1 21	60	Lack of work	306	"
1459	Marshall	19	"	----	s	--	--	"	"	10	"	1 00	78	" "	285	150
1460	"	28	"	----	m	2	1	"	"	10	yes	1 25	40	" "	341	none
1461	"	40	"	----	s	--	--	"	"	10	----	1 25	none	----------------	391	100
1462	"	17	"	----	"	--	--	"	"	10	no	1 25	30	Lack of work	354	75
1463	"	24	"	----	"	--	--	"	"	10	"	1 75	6	Pleasure	537	100
1464	Northville	32	"	----	m	2	2	"	"	10	yes	1 60	24	Lack of work	462	none
1465	"	39	"	----	"	2	1	"	"	10	no	1 40	26	" "	402	100
1466	"	52	"	----	"	2	1	"	"	10	"	1 40	180	*Sickness	298	60
1467	"	40	"	----	"	2	5	"	"	10	yes	1 25	30	Lack of work*	354	100
1468	"	38	"	----	"	2	4	"	"	10	"	1 40	5	" "	431	none
1469	Ovid	50	"	----	"	2	1	"	"	10	no	1 60	156	" "	250	"
1470	"	30	Ger.	----	"	2	1	"	"	10	"	1 25	150	Other work	203	"
1471	"	16	Am.	----	s	--	--	"	"	10	"	50	150	" "	82	"
1472	Saginaw	29	"	----	"	--	--	"	"	10	"	2 50	6	Pleasure	767	100
1473	"	23	Ger.	----	"	--	--	"	"	10	"	1 25	12	Lack of work	376	none
1474	"	41	Am	----	m	2	3	"	"	10	yes	1 26	36	Sickness	350	"
1475	"	32	Ger.	----	"	2	2	"	"	10	"	2 00	100	----------------	426	"
1476	Linden	66	Am.	----	s	--	--	"	"	10	no	1 75	153	Lack of work	280	"
1477	Mt. Clemens	34	Ger.	----	m	2	--	"	"	10	"	1 75	4	Holidays	541	75
1478	Rochester	26	Am.	----	s	--	--	"	"	10	yes	1 50	6	Sickness	460	75
1479	Kalamazoo	39	"	----	m	2	2	Blacksmith	pc.	10	no	1 75	10	Lack of work	530	75
1480	"	45	"	----	"	2	1	"	day	10	"	2 00	50	" "	326	none
1481	"	22	"	----	s	--	--	"	"	10	"	1 00	30	" "	283	"
1482	"	20	"	----	"	--	--	"	"	10	"	1 00	30	" "	283	"
1483	"	25	"	----	"	--	--	"	pc.	10	"	1 50	60	" "	380	"
1484	"	20	"	----	"	--	--	"	day	10	"	1 25	10	" "	379	"
1485	"	50	"	----	m	2	3	"	pc.	10	"	1 75	10	" "	530	"
1486	"	21	"	----	s	--	--	"	day	10	"	1 50	none	----------------	470	125
1487	"	34	"	----	"	--	--	"	pc.	10	"	1 50	30	Lack of work	425	none
1488	"	35	"	----	m	2	--	"	day	10	"	1 37	30	" "	388	20
1489	"	40	"	----	"	2	4	"	pc.	10	"	1 75	60	" "	443	none
1490	"	25	"	----	"	2	--	"	"	10	"	1 75	30	" "	495	"
1491	"	32	------	----	"	2	2	"	day	10	"	2 00	none	----------------	426	115
1492	"	32	Am.	----	"	2	2	"	"	10	"	2 50	"	----------------	783	200
1493	"	21	"	----	s	--	--	"	pc.	10	"	1 25	"	----------------	391	15
1494	"	21	"	----	"	--	--	"	"	10	"	1 25	"	----------------	391	50
1495	"	26	"	----	m	2	3	"	"	10	"	2 00	"	----------------	626	90
1496	"	28	Hol.	----	"	2	1	"	day	10	"	1 50	150	Lack of work	245	none
1497	"	38	Am.	----	"	2	--	"	pc.	10	"	2 50	none	----------------	783	200
1498	"	35	"	----	"	2	1	"	day	10	"	1 50	150	Lack of work	245	none
1499	"	50	"	----	"	2	4	"	"	10	---	1 50	150	" "	245	"
1500	"	20	"	----	s	--	--	"	"	10	no	1 00	150	" "	163	"

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* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.									no	no	B. of B. M.	no	no	no	no	yes	yes	1451
"									"	"	"	"	"	"	"	"	"	1452
s-mo.											None					"	"	1453
"	yes	yes					no		yes	no	"					"	"	1454
"	"	"					yes				"					"	"	1455
"	"	no		$7			"		yes	no	"					no	"	1456
"	no							$5 00	"	"	"					yes	"	1457
"	yes	yes					no		no	"	"					"	"	1458
"	no								"	"	"					"	"	1459
"	yes	no	mort.	300	7	no	yes		"	"	"					"	"	1460
wk.	"	yes					"		"	"	"					"	"	1461
"									"	"	"					"	"	1462
"									yes	"	"					no	no	1463
"	yes	no	mort.	200	6	yes	yes		"		"					yes	yes	1464
"	"	"	"	600	7	"	"		"	no	"					"	"	1465
"	"	"	"	600	7	"	"		"		"					"	"	1466
"	"	"	cont.	600	7	"	"				"					"	"	1467
"	"	"	mort.	300	7	"	"		yes		"					"	"	1468
s-mo.	"	yes					no		no	no	"					"	"	1469
"	"	no	cont.	200	7	no	"		"		"					"	no	1470
"											"					"	"	1471
wk.	no							6 00	no	yes	"					"	yes	1472
s-mo.											"							1473
"	no							5 00	yes	yes	"					yes	yes	1474
wk.	"							8 00	no	no	Musicians' Union	no	no	no	no	no	no	1475
"	yes	yes					no		"	"	" "					yes	"	1476
"	no							6 00	yes	"	*					"	yes	1477
"	"							7 50			None					"	"	1478
"	yes								yes		"					"	"	1479
"	"	yes					yes				"					"	"	1480
"											"					"	"	1481
"											"					"	"	1482
"									yes		"					"	"	1483
"											"					"	"	1484
"	no							7 00	yes		"					"	"	1485
"									"		"					"	"	1486
"									"		"					"	"	1487
"	yes	yes					yes		"		"					"	"	1488
"	"	no	cont.	200	6	yes	"		no		"					"	"	1489
"	no										"					"	"	1490
"	yes	yes					yes		yes		"					"	"	1491
"	"	"					"		"		"					"	"	1492
s-mo.											"					"	"	1493
"									yes		"					"	"	1494
"	no							10 00	"		"					"	"	1495
"	"							6 00			"					"	"	1496
"	"							10 00	yes		"					"	"	1497
"	"										"					"	"	1498
"	"							7 00			C. & W. M. U.	no	no	no	yes	"	"	1499
"											None					"	"	1500

* Donaldson Bros. Employés Sick and Accident Benefit Association.

Book No. 32.

Table No. 1.—Continued.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1551	Kalamazoo.	34	Irish	14	m	2	3	Blacksmith.	day	10	----	$1 50	30	Lack of work	$440	none
1552	"	32	Am.	----	"	2	1	"	"	10	no	2 50	120	" "	483	"
1553	"	33	"	----	"	2	2	"	pc.	10	"	2 50	60	" "	633	$200
1554	"	2[illegible]	"	----	s	--	--	"	day	10	----	1 50	30	" "	425	none
1555	"	35	"	----	m	2	2	"	pc.	10	no	2 00	30	" "	566	50
1556	"	41	"	----	"	3	4	"	day	10	----	2 00	125	" "	376	none
1557	"	30	"	----	s	--	--	"	"	10	----	1 75	100	" "	372	50
1558	"	45	"	----	m	2	1	"	"	10	----	2 50	60	" "	633	none
1559	"	40	"	----	s	--	--	"	"	10	----	2 30	20	Other business	674	150
1560	"	3[illegible]	Hol.	30	m	2	4	"	"	10	----	1 75	130	Lack of work	320	25
1561	"	40	Am.	----	s	--	--	"	"	10	----	2 00	95	" "	496	75
1562	"	38	"	----	m	2	--	"	"	10	----	2 00	50	" "	526	100
1563	"	42	Irish	35	"	2	4	"	pc.	10	----	2 00	125	" "	376	none
1564	"	30	Am.	----	s	--	--	"	"	10	----	1 75	150	" "	268	30
1565	"	26	Hol	25	m	2	4	"	day	10	----	1 75	185	" "	224	none
1566	"	55	Am	----	"	2	--	"	"	10	no	1 60	65	" "	397	"
1567	Detroit......	69	"	----	"	2	--	"	"	10	"	2 50	12	Vacation	753	100
1568	"	40	"	----	"	2	2	"	"	10	yes	2 25	6	"	691	50
1569	"	46	Ger.	23	"	2	3	"	"	10	no	2 50	6	"	767	500
1570	"	52	"	26	"	3	2	"	"	10	"	2 50	none	----------------	782	none
1571	"	35	"	27	"	2	1	"	"	10	"	2 50	"	----------------	782	300
1572	"	49	"	27	"	2	4	"	"	10	"	2 00	8	Sickness	610	none
1573	"	22	Am.	----	s	--	--	"	"	10	"	1 14	5	Holidays.....	237	"
1574	"	37	Ger.	27	m	2	2	"	"	10	"	2 50	none	----------------	782	350
1575	"	36	Am.	----	"	2	2	"	pc.	10	"	2 50	60	Lack of work	633	100
1576	"	33	"	---	"	2	3	"	"	10	"	2 50	30	" "	708	150
1577	"	31	"	----	"	2	2	"	"	10	"	2 00	60	Sickness	506	none
1578	"	40	"	----	"	2	2	"	"	10	"	2 50	none	----------------	783	200
1579	"	48	"	----	s	--	--	"	wk.	10	"	2 50	30	Sickness	708	200
1580	"	36	"	----	m	2	2	"	pc.	10	"	2 50	30	Lack of work	708	100
1581	"	49	Ger.	36	"	2	2	"	day	10	"	1 50	90	" "	335	none
1582	"	52	"	28	"	2	4	"	"	10	----	1 50	3	" "	465	"
1583	"	29	"	21	"	2	2	"	"	10	no	1 50	10	" "	303	"
1584	"	24	Am.	----	"	2	--	"	"	10	"	1 50	12	" "	455	"
1585	"	28	"	----	"	2	4	"	wk.	10	"	2 00	6	Holidays.....	614	300
1586	"	23	Can	5	s	--	--	"	"	10	----	1 30	none	----------------	407	50
1587	"	28	"	9	"	--	--	"	day	10	----	2 00	"	----------------	626	200
1588	"	40	"	20	m	2	2	"	"	10	----	2 50	"	----------------	783	100
1589	"	19	Am.	----	s	--	--	"	wk.	10	----	1 30	"	----------------	407	------
1590	"	25	Ger.	15	m	2	1	"	day	10	----	1 50	"	----------------	469	50
1591	"	35	Am.	----	"	2	6	"	"	10	----	2 50	20	Lack of work	593	none
1592	"	25	"	----	s	--	--	"	"	10	----	2 00	14	Vacation	598	150
1593	"	26	Ger.	10	m	2	1	"	"	10	no	2 00	none	----------------	626	------
1594	"	35	Am.	----	"	2	2	"	"	10	"	2 00	25	Sickness	576	none
1595	"	19	Ger.	----	s	--	--	"	"	10	"	50	none	----------------	156	"
1596	"	24	Am.	--	"		--	"	"	10	"	2 00	"	----------------	626	100
1597	"	31	Can.	11	m	2	2	"	"	10	yes	1 75	40	Lack of work	477	none
1598	"	35	"	12	"	3	2	"	"	10	"	2 25	40	" "	614	"
1599	"	5[illegible]	Fr.	43	"	2	1	"	"	10	no	2 50	4	----------------	773	"
1600	"	23	Am.	----	s	--	--	"	"	10	"	1 50	none	----------------	470	100

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	yes	no	mort.	$650	7	no	yes	----	yes	no	C. & W. M. U.	no	no	no	yes	no	no	1551
"	no	----	----	----	----	----	----	$6 00	----	----	None	----	----	----	----	yes	"	1552
"	yes	no	cont.	350	7	yes	yes	----	yes	no	C. & W. M. U.	no	no	no	yes	"	yes	1553
mo.	----	----	----	----	----	----	----	----	no	----	None	----	----	----	----	"	"	1554
wk.	yes	no	mort.	300	7	yes	yes	----	yes	no	C. & W. M. U.	no	no	----	yes	"	"	1555
"	"	yes	----	----	----	----	"	----	"	"	"	"	"	----	"	"	"	1556
"	----	----	----	----	----	----	----	----	----	----	None	----	----	----	----	"	"	1557
"	no	----	----	----	----	----	----	10 00	----	----	"	----	----	----	----	"	"	1558
"	"	----	----	----	----	----	----	10 00	----	----	"	----	----	----	----	"	"	1559
"	"	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	1560
"	----	----	----	----	----	----	----	----	yes	----	"	----	----	----	----	"	"	1561
"	no	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	1562
"	"	----	----	----	----	----	----	7 00	----	----	"	----	----	----	----	"	"	1563
"	----	----	----	----	----	----	----	----	----	----	C. & W. M. U.	----	----	----	yes	no	no	1564
"	yes	no	----	----	----	----	yes	----	----	----	None	----	----	----	----	yes	yes	1565
s-mo.	no	----	----	----	----	----	----	7 00	----	----	"	----	----	----	----	"	"	1566
wk.	yes	yes	----	----	----	----	yes	----	no	no	"	----	----	----	----	no	no	1567
"	no	----	----	----	----	----	----	9 00	yes	----	"	----	----	----	----	"	"	1568
"	yes	no	mort	1,500	7	yes	yes	----	"	no	"	----	----	----	----	"	"	1569
"	"	yes	----	----	----	----	"	----	"	"	"	----	----	----	----	"	"	1570
"	"	no	mort.	900	7	yes	"	----	"	"	"	----	----	----	----	yes	yes	1571
"	no	----	----	----	----	----	----	8 50	"	"	"	----	----	----	----	"	"	1572
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	1573
"	yes	no	mort	1,000	7	yes	yes	----	"	"	"	----	----	----	----	"	"	1574
s-mo.	no	----	----	----	----	----	----	10 00	no	"	"	----	----	----	----	"	"	1575
"	yes	yes	----	----	----	----	----	----	yes	"	"	----	----	----	----	"	"	1576
"	no	----	----	----	----	----	----	8 00	no	"	"	----	----	----	----	"	"	1577
"	"	----	----	----	----	----	----	10 00	yes	"	"	----	----	----	----	"	"	1578
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	1579
"	no	----	----	----	----	----	----	12 00	yes	no	"	----	----	----	----	"	"	1580
wk.	yes	yes	----	----	----	----	yes	----	"	----	"	----	----	----	----	no	no	1581
"	"	no	mort.	100	7	yes	"	----	no	no	"	----	----	----	----	"	"	1582
"	"	yes	----	----	----	----	"	----	----	----	"	----	----	----	----	yes	"	1583
"	no	----	----	----	----	----	----	10 00	yes	no	"	----	----	----	----	"	"	1584
"	"	----	----	----	----	----	----	10 00	"	"	"	----	----	----	----	"	"	1585
"	----	----	----	----	----	----	----	----	"	----	"	----	----	----	----	"	yes	1586
"	----	----	----	----	----	----	----	----	"	----	"	----	----	----	----	"	"	1587
"	no	----	----	----	----	----	----	10 00	"	----	"	----	----	----	----	"	"	1588
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	1589
"	no	----	----	----	----	----	----	6 00	----	----	"	----	----	----	----	"	"	1590
"	yes	no	cont.	600	6	no	yes	----	yes	----	"	----	----	----	----	"	"	1591
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	1592
"	no	----	----	----	----	----	----	6 00	----	----	"	----	----	----	----	"	"	1593
"	"	----	----	----	----	----	----	7 00	----	----	"	----	----	----	----	"	"	1594
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	1595
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	1596
s-mo.	no	----	----	----	----	----	----	9 00	yes	no	"	----	----	----	----	"	no	1597
"	"	----	----	----	----	----	----	10 00	"	"	"	----	----	----	----	no	"	1598
"	yes	no	mort.	300	7	yes	yes	----	"	"	"	----	----	----	----	yes	"	1599
"	----	----	----	----	----	----	----	----	no	----	"	----	----	----	----	"	"	1600

Book No. 33. **Table No. 1.**—CONTINUED.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1601	Detroit	41	Ger.	15	m	2	3	Blacksmith	day	10	no	$2 75	none	-----	$861	none
1602	"	27	Irish	16	"	2	2	"	"	10	"	1 50	30	Lack of work	425	"
1603	"	29	Eng.	9	"	2	1	"	"	10	"	1 40	30	" "	396	"
1604	"	26	Ger.	22	"	2	--	"	"	10	yes	1 60	none	-----	501	$75
1605	"	32	"	18	"	2	7	"	"	10	no	2 00	"	-----	626	50
1606	"	22	Am.	----	"	2	--	"	"	10	"	2 10	6	Vacation	645	100
1607	"	52	Can.	33	"	2	5	"	"	10	"	1 75	53	Lack of work	455	none
1608	"	37	"	----	"	2	6	"	"	10	"	2 00	103	" "	420	"
1609	"	19	Am.	----	s	--	--	"	"	10	"	60	90	" "	134	"
1610	"	30	"	----	m	2	--	"	"	10	"	1 50	none	-----	470	150
1611	"	47	Ger.	31	"	2	4	"	"	10	"	1 75	"	-----	547	-----
1612	"	27	Am.	----	"	2	1	"	"	10	"	1 50	"	-----	470	100
1613	"	37	"	----	"	2	2	"	"	10	----	2 00	20	Sickness	586	150
1614	"	21	Ger.	----	s	--	--	"	"	10	no	2 00	none	-----	626	100
1615	"	27	Am.	----	"	--	--	"	"	10	"	2 25	"	-----	704	200
1616	"	28	"	----	m	2	1	"	wk.	10	"	2 00	30	Sickness*	566	100
1617	"	18	Ger.	----	s	--	--	"	"	10	"	45	none	-----	140	-----
1618	Jackson	43	"	29	m	2	2	"	pc.	10	"	2 00	10	Pleasure	606	75
1619	"	45	"	----	"	2	1	"	day	10	"	1 75	30	Sickness	495	50
1620	"	62	Am.	----	"	6	--	"	"	10	"	1 50	12	"	452	50
1621	"	33	Ger.	----	"	2	--	"	pc.	10	"	1 50	none	-----	470	none
1622	"	26	Irish	----	"	2	1	"	day	10	"	2 25	6	Lack of work	691	50
1623	"	28	Am.	----	"	2	2	"	pc.	10	"	1 50	none	-----	470	none
1624	"	54	"	----	"	2	--	"	day	10	"	1 75	"	-----	548	100
1625	"	41	Ger.	----	"	2	2	"	pc.	10	"	2 00	10	Lack of work	606	100
1626	"	45	"	----	"	3	1	"	day	10	"	1 50	6	Sickness	461	none
1627	"	39	Scot.	20	"	2	2	"	"	10	"	2 00	none	-----	626	150
1628	"	42	Am.	----	"	2	--	"	"	10	"	1 75	"	-----	548	none
1629	"	50	"	----	"	3	1	"	pc.	10	"	2 50	"	-----	783	100
1630	"	41	Ger.	25	"	3	1	"	"	10	"	2 00	30	Sickness	566	100
1631	"	27	Am.	----	"	2	--	"	day	10	"	2 00	30	Lack of work	566	250
1632	"	40	Can.	20	"	2	4	"	"	10	"	2 70	none	-----	845	none
1633	"	26	Am.	----	"	2	--	"	"	10	"	1 68	2	Sickness	522	2
1634	"	21	"	----	"	2	--	"	pc.	10	"	1 35	18	Lack of work	398	20
1635	"	26	Can.	15	"	2	--	"	day	10	yes	2 25	10	Laid off	682	none
1636	"	38	Ger.	14	"	2	4	"	"	10	"	1 85	20	Other work	550	"
1637	"	30	Am.	----	"	2	3	"	pc.	10	no	2 00	30	" "	566	100
1638	"	22	"	----	"	2	1	"	day	10	yes	1 75	78	Laid off	411	none
1639	"	40	"	----	"	3	--	"	"	10	"	1 66	52	-----	433	"
1640	"	61	"	----	s	--	--	"	"	10	no	2 00	100	Various	426	200
1641	"	24	"	----	"	--	--	"	----	10	----	2 00	20	Lack of work	586	50
1642	"	50	"	----	m	4	4	"	day	10	no	2 50	20	" "	732	none
1643	"	25	"	----	"	2	--	"	"	10	"	1 75	12	Sickness	527	"
1644	"	19	"	----	s	--	--	"	"	10	"	1 50	30	"	425	"
1645	"	35	"	----	m	2	1	"	"	10	"	1 50	5	"	462	"
1646	"	26	"	----	s	--	--	"	"	10	"	1 66	60	Lack of work	420	"
1647	"	35	"	----	"	--	--	"	"	10	yes	2 00	40	" "*	546	200
1648	"	34	Ger.	15	m	2	3	"	wk.	10	"	1 50	40	-----	425	none
1649	"	48	Scot.	25	w	1	2	"	day	10	no	2 00	30	Other work	566	"
1650	"	27	Am.	----	m	2	1	"	"	10	yes	1 75	18	Sickness	516	-----

* And vacation.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.	yes	no					yes		yes		None					no	no	1601
wk.	no							$7 00	"	no	"					"	"	1602
"	"							7 00	no	"	"					yes	yes	1603
s-mo.	yes	yes					yes				"					"	"	1604
wk.	no							12 00			"					"	"	1605
"	"							11 00			"					"	"	1606
"	yes	yes					yes		yes	no	"					"	"	1607
"	"	no	cont.	$600	7	yes	"		no	yes	"					"	"	1608
"									yes	no	"					"	"	1609
"	no							10 00			"					"	no	1610
"	yes	no	cont.	100	7	yes	yes				"					"	"	1611
"	no							8 00	yes		"					"	"	1612
"	yes	no	mort.	500	6	yes	yes		no	no	"					"	"	1613
"									yes		"					"	"	1614
"											"					"	"	1615
"	yes	yes					yes		no	no	"					"	"	1616
"											"					"	yes	1617
"	no							9 00	no	no	"					"	"	1618
"	yes	no	cont.	200	6	yes	yes		"	"	"					"	"	1619
"	no							4 00	"	"	"					"	"	1620
"	"							10 00	yes	"	"					"	"	1621
"	"								"	yes	"					"	"	1622
"	yes	yes					yes		no	no	"					"	"	1623
"	"	"					"		"	"	"					"	"	1624
"	no							8 00	"	"	"					"	"	1625
"	yes	no	cont.	400		yes	yes		"	"	"					"	"	1626
"	"	yes					"		yes	"	"					"	"	1627
"	no							8 00	no	"	"					"	"	1628
"	"							6 00	yes	"	"					"	"	1629
"	"							8 00	no	"	"					"	"	1630
"	yes	no	mort.	150	5	yes	no		yes	"	"					"	"	1631
"	"	"	cont.	600	7	"	yes		"		"					"	"	1632
"	no							6 00			"					"	"	1633
s-mo.	"							6 00			"					"	"	1634
"	"							10 00			"					"	"	1635
"	"							8 00	yes	no	"					"	no	1636
"	"							7 00	"	yes	"					"	"	1637
"	"							7 00	no	no	"					"	"	1638
"	"							4 00	"		"					"	yes	1639
"											"					"	"	1640
"									no		C. & W. M. U.		yes	no	no	"	"	1641
wk.	no							10 00	"		None					"	"	1642
"	"							8 00			"					"	"	1643
"									no		"					"	"	1644
"	no								yes		"					"	"	1645
"									no		"					"	"	1646
"									"	no	"					"	"	1647
"	no								"	"	"					"	"	1648
"	"							10 00	yes	yes	"					"	"	1649
"	yes	no	cont.	890	7	yes	yes				"					"	"	1650

Book No. 34. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work.	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1651	Jackson ----	39	Scot.	27	m	2	4	Blacksmith.	day	10	no	$2 00	12	Lack of work	$602	none
1652	" ----	36	Am.	--	"	2	1	"	pc.	10	"	2 50	25	---------------	720	"
1653	" ----	24	"	----	s	--	--	"	day	10	"	1 75	12	Lack of work	527	"
1654	" ----	38	"	----	m	2	1	"	pc.	10	"	1 50	60	" "	380	$118
1655	" ----	27	"	----	s	--	--	"	"	10	"	2 00	150	" "	326	------
1656	" ----	28	Ger.	20	m	2	3	"	"	10	"	2 25	60	" "	569	175
1657	" ----	25	Am.	----	"	2	3	"	day	10	"	1 75	30	" "	495	none
1658	" ----	19	"	----	s	--	--	"	"	10	"	1 50	96	" "	335	"
1659	" ----	27	"	----	m	2	1	"	pc.	10	"	2 00	none	---------------	626	150
1660	" ----	29	"	----	"	2	--	"	"	10	"	2 50	"	---------------	783	400
1661	" ----	28	"	---	"	2	--	"	"	10	yes	2 00	30	Lack of work*	566	25
1662	G'd Rapids.	20	"	----	s	--	--	"	day	10	no	1 25	36	" "	346	50
1663	"	33	Ger.	31	m	2	3	"	pc.	10	"	1 50	18	" "	442	none
1664	"	47	"	23	"	2	6	"	day	10	"	1 80	75	" "	428	"
1665	"	45	"	14	"	2	3	"	"	10	"	1 75	78	" "	411	"
1666	"	42	"	16	"	2	1	"	pc.	10	"	1 80	52	" "	470	"
1667	"	41	Can.	13	"	2	2	"	day	10	"	2 00	26	" "	574	100
1668	"	39	Ger.	15	"	2	4	"	"	10	"	1 40	104	" "	293	none
1669	"	35	Am.	----	"	2	2	"	pc.	10	"	2 00	26	" "	574	25
1670	"	40	Swe.	17	"	2	6	"	"	10	"	1 75	52	" "	457	none
1671	"	39	Can.	15	"	2	1	"	day	10	"	1 30	78	" "	306	"
1672	"	24	Swe.	5	"	2	1	"	"	10	"	1 45	65	" "	460	"
1673	"	54	Ger.	24	"	2	6	"	pc.	10	"	2 00	50	" "	526	200
1674	"	31	Pol.	5	"	2	2	"	"	10	"	2 00	65	" "	496	none
1675	"	57	Swe.	26	"	2	2	"	day	10	"	2 00	10	" "	606	"
1676	"	39	Ger.	13	"	2	2	"	pc.	10	"	1 80	70	" "	437	"
1677	"	35	"	15	"	2	4	"	day	10	"	2 00	78	" "	470	"
1678	"	53	"	28	"	2	4	"	"	10	"	1 75	52	" "	457	"
1679	"	47	"	31	"	2	9	"	"	10	"	3 00	none	---------------	939	200
1680	"	35	"	20	"	2	3	"	"	10	"	2 00	208	Lack of work	210	none
1681	"	42	Am.	----	"	2	3	"	"	10	"	2 03	48	" " *	538	"
1682	"	46	Swe.	26	"	2	5	"	"	10	"	2 00	26	Sickness -----	574	"
1683	"	38	Hol.	12	"	2	3	"	"	10	"	1 50	24	" -----	433	"
1684	"	47	Fr.	46	"	2	7	"	"	10	"	2 25	156	Lack of work*	353	"
1685	"	57	Hol.	29	w	1	6	"	"	10	"	1 25	12	" "	376	"
1686	"	35	"	6	m	2	1	"	"	10	"	1 35	none	---------------	423	"
1687	"	51	"	24	"	2	4	"	"	10	"	1 75	24	Lack of work	506	"
1688	"	24	Ger.	7	"	2	--	"	"	10	"	1 60	none	---------------	501	150
1689	"	37	Am.	---	s	--	--	"	"	10	"	2 25	12	Pleasure -----	677	none
1690	"	24	"	----	"	--	--	"	"	10	"	1 50	78	Lack of work	353	50
1691	"	53	Irish	40	m	2	2	"	"	10	yes	2 00	none	---------------	626	50
1692	"	27	Am.	----	s	--	--	"	"	10	no	1 50	"	---------------	470	125
1693	"	48	"	----	m	2	3	"	"	10	"	2 25	30	Other business	637	none
1694	"	25	"	----	"	2	--	"	"	10	"	1 15	52	Sickness -----	300	"
1695	"	55	Swe.	31	"	2	1	"	"	10	"	1 50	none	---------------	470	"
1696	"	22	Am.	----	s	--	--	"	"	10	"	1 50	78	Lack of work	352	"
1697	"	39	"	----	m	2	5	"	"	10	"	2 25	none	---------------	704	100
1698	"	28	Can	----	s	--	--	"	"	10	"	2 50	36	Pleasure -----	692	100
1699	"	32	Pol.	5	m	2	1	"	"	10	yes	1 50	none	---------------	528	none
1700	"	28	Can.	17	s	--	--	"	"	10	"	3 00	104	Lack of work	744	200

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* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	yes	no	cont.	$270	7	no	yes	----	yes	no	None	----	----	----	----	yes	yes	1651
"	no	----	----	----	----	----	----	$5 00	no	"	"	----	----	----	----	"	"	1652
s-mo.	----	----	----	----	----	----	----	----	"	----	"	----	----	----	----	no	"	1653
"	yes	no	mort.	500	7	yes	yes	----	yes	----	"	----	----	----	----	yes	yes	1654
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	no	1655
"	yes	yes	----	----	----	----	yes	----	yes	----	"	----	----	----	----	"	"	1656
"	no	----	----	----	----	----	----	10 00	no	----	"	----	----	----	----	"	yes	1657
"	----	----	----	----	----	----	----	----	"	----	"	----	----	----	----	"	"	1658
"	yes	no	cont.	200	6	yes	yes	----	yes	----	"	----	----	----	----	"	"	1659
wk.	"	"	mort.	700	7	"	"	----	no	no	"	----	----	----	----	"	"	1660
"	no	----	----	----	----	----	----	----	yes	"	"	----	----	----	----	"	"	1661
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	1662
"	no	----	----	----	----	----	----	6 00	"	"	"	----	----	----	----	"	"	1663
"	yes	no	mort.	800	8	no	yes	----	yes	"	"	----	----	----	----	no	no	1664
"	"	"	"	700	7	yes	"	----	no	"	"	----	----	----	----	"	"	1665
"	"	"	"	400	8	"	"	----	"	"	"	----	----	----	----	"	"	1666
"	no	----	----	----	----	----	----	5 00	yes	"	"	----	----	----	----	yes	yes	1667
"	yes	no	mort.	500	7½	yes	yes	----	no	"	"	----	----	----	----	no	no	1668
"	no	----	----	----	----	----	----	6 00	"	"	"	----	----	----	----	yes	yes	1669
"	"	----	----	----	----	----	----	9 00	yes	"	"	----	----	----	----	"	"	1670
"	"	----	----	----	----	----	----	6 00	"	"	"	----	----	----	----	"	"	1671
"	"	----	----	----	----	----	----	6 00	no	"	"	----	----	----	----	"	"	1672
"	yes	no	mort.	200	7½	yes	yes	----	yes	"	"	----	----	----	----	"	"	1673
"	"	"	"	900	7	"	"	----	no	"	"	----	----	----	----	no	no	1674
"	"	yes	----	----	----	----	"	----	yes	"	"	----	----	----	----	yes	yes	1675
"	"	no	mort.	300	7	no	"	----	"	"	"	----	----	----	----	"	"	1676
"	"	"	"	700	7	yes	"	----	no	yes	B. of B. M.	no	no	no	yes	"	"	1677
"	"	"	----	----	----	----	----	----	"	no	None	----	----	----	----	"	"	1678
"	"	yes	----	----	----	----	yes	----	yes	"	"	----	----	----	----	----	--	1679
"	"	no	mort.	800	7	yes	"	----	"	"	"	----	----	----	----	yes	yes	1680
"	"	"	"	300	7	"	"	----	"	"	"	----	----	----	----	"	"	1681
"	"	"	cont.	1,100	6	"	"	----	"	"	"	----	----	----	----	"	"	1682
"	"	"	mort.	200	7	"	"	----	"	"	"	----	----	----	----	"	"	1683
"	no	----	----	----	----	----	----	9 00	no	"	"	----	----	----	----	"	"	1684
"	yes	no	mort.	500	8	yes	yes	----	"	"	"	----	----	----	----	"	"	1685
"	no	----	----	----	----	----	----	5 00	yes	"	"	----	----	----	----	"	"	1686
"	yes	yes	----	----	----	----	yes	----	no	"	"	----	----	----	----	no	"	1687
"	"	"	----	----	----	----	"	----	yes	"	"	----	----	----	----	yes	no	1688
"	"	"	----	----	----	----	no	----	no	"	"	----	----	----	----	"	yes	1689
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	1690
"	yes	yes	----	----	----	----	yes	----	----	----	"	----	----	----	----	"	"	1691
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	1692
"	yes	no	mort.	500	7	yes	yes	----	"	"	"	----	----	----		"	no	1693
"	no	----	----	----	----	----	----	----	----	----	"	----	-	----	----	"	yes	1694
"	yes	no	----	----	----	----	----	----	----	----	"	----	----	----	----	----	----	1695
"	----	----	----	----	----	----	----	----	no	no	"	----	----	--	--	yes	yes	1696
"	yes	yes	----	----	----	----	yes	----	yes	"	"	----	----	----	----	"	"	1697
"	----	----	----	----	----	----	----	----	"	"	J. Horseshoers U.	no	yes	yes	yes	"	"	1698
s-mo.	no	----	----	----	----	----	----	3 00	no	"	None	----	----	----	----	"	"	1699
"	yes	yes	----	----	----	----	yes	----	yes	"	"	----	----	----	----	"	"	1700

Book No. 35. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1701	Flint	44	Am.	----	m	2	3	Blacksmith	day	10	no	$2 50	10	Lack of work	$757	$50
1702	"	42	Can.	10	"	2	2	"	"	10	"	2 25	90	" "	502	none
1703	"	29	Am.	----	"	2	1	"	"	10	"	1 25	120	" "	241	"
1704	"	38	Can.	7	"	3	--	"	"	10	yes	2 00	40	" " *	546	100
1705	"	31	Irish	17	s	--	--	"	pc.	10	no	1 60	60	" "	404	150
1706	"	19	Am.	----	"	--	--	"	day	10	"	1 16	210	" "	119	none
1707	"	33	"	----	m	2	1	"	"	10	"	1 33	90	" "	297	"
1708	"	22	"	----	"	2	1	"	"	10	"	1 50	60	" "	380	15
1709	"	29	"	----	"	2	1	"	pc.	10	"	2 00	60	" "	506	50
1710	"	23	"	----	"	2	1	"	day	10	"	1 25	90	" "	279	50
1711	"	16	"	----	s	--	--	"	"	10	"	58	60	" "	146	none
1712	"	18	"	----	"	--	--	"	"	10	"	1 25	90	" "	297	"
1713	"	18	Can.	9	"	--	--	"	"	10	"	1 00	60	" "	253	"
1714	"	22	Am.	----	"	--	--	"	pc.	10	"	1 25	60	" "	316	"
1715	"	22	"	----	m	2	--	"	day	10	"	1 50	30	" "	429	"
1716	"	17	"	----	s	--	--	"	wk.	10	"	70	20	" "	205	"
1717	"	17	"	----	"	--	--	"	day	10	"	75	90	Sickness	167	"
1718	"	46	"	----	m	2	2	"	pc.	10	"	1 75	3	Laid off	542	200
1719	"	27	"	----	"	2	--	"	wk.	10	"	1 12	3	Lack of work	347	none
1720	"	23	"	----	"	--	--	"	day	10	"	1 50	10	" "	455	"
1721	"	24	"	----	s	--	--	"	pc.	10	"	3 00	30	Vacation	849	"
1722	"	49	"	----	m	3	1	"	day	10	"	1 25	30	" *	354	"
1723	"	27	Scot.	14	"	2	--	"	"	10	"	1 50	90	Lack of work	335	"
1724	"	33	Can.	31	"	2	2	"	"	10	"	1 25	60	Sickness	316	80
1725	"	24	Am.	----	"	--	--	"	"	10	"	1 50	10	----------------	455	none
1726	"	25	Ger.	24	"	2	1	"	pc.	10	yes	1 50	30	Lack of work	425	"
1727	"	31	Am.	----	"	2	1	"	"	10	no	2 25	40	" "	614	100
1728	"	23	"	----	"	2	--	"	"	10	yes	2 25	50	Sickness	592	135
1729	"	21	"	----	s	--	--	"	day	10	no	1 00	20	Lack of work	293	none
1730	"	34	"	----	m	2	--	"	"	10	"	1 33	30	" "	376	"
1731	"	39	"	----	"	2	2	"	pc.	10	"	1 50	25	" "	432	------
1732	"	27	"	----	"	2	3	"	day	10	"	1 50	90	" "	335	none
1733	"	28	"	----	s	--	--	"	"	10	"	1 25	40	" "	341	"
1734	"	29	"	----	"	--	--	"	pc.	10	"	1 25	30	" "	316	40
1735	"	30	"	----	m	2	--	"	"	10	"	2 50	90	" "	558	50
1736	"	33	Can.	4	"	2	2	"	"	10	yes	2 00	15	Vacation	596	none
1737	"	32	Eng.	8	"	2	2	"	"	10	no	1 50	78	"	353	"
1738	"	27	Am.	----	s	--	--	"	"	10	"	2 00	110	" *	406	"
1739	"	33	Can.	10	m	2	--	"	"	10	"	1 50	78	Accident *	353	"
1740	"	24	Am.	----	"	2	2	"	day	10	"	1 50	30	Vacation*	425	"
1741	"	43	"	----	"	2	2	"	pc.	10	yes	1 75	20	"	513	"
1742	"	45	"	----	"	2	3	"	day	10	"	1 12	15	" *	335	"
1743	"	49	Can.	26	"	2	5	"	pc.	10	no	1 50	60	"	380	"
1744	"	48	Am.	----	"	2	2	"	"	10	"	3 00	30	Lack of work	849	"
1745	"	32	"	----	s	--	--	"	wk.	10	"	2 00	none	----------------	626	200
1746	"	19	"	----	"	--	--	"	day	10	"	1 00	48	Sickness	265	none
1747	"	26	Can.	4	"	--	--	"	"	10	"	1 40	40	"	382	100
1748	"	15	Am.	----	"	--	--	"	"	10	"	50	48	Vacation	133	35
1749	"	20	"	----	"	--	--	"	"	10	"	1 41	6	"	483	125
1750	"	20	"	----	"	--	--	"	"	10	"	1 00	72	Sickness	241	50

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	no	----	----	----	----	----	----	$9 00	yes	no	None ----	----	----	----	----	yes	yes	1701
"	"	----	----	----	----	----	----	10 00	"	"	" ----	----	----	----	----	"	"	1702
"	"	----	----	----	----	----	----	5 00	"	"	" ----	----	----	----	----	"	"	1703
"	"	----	----	----	----	----	----	9 00	"	"	" ----	----	----	----	----	"	"	1704
----	----	----	----	----	----	----	----	----	"	yes	" ----	----	----	----	----	"	"	1705
wk.	----	----	----	----	----	----	----	----	no	no	" ----	----	----	----	----	no	"	1706
"	yes	no	mort.	$400	7	yes	yes	----	----	----	" ----	----	----	----	----	yes	"	1707
"	no	----	----	----	----	----	----	7 50	no	no	" ----	----	----	----	----	"	"	1708
"	"	----	----	----	----	----	----	6 00	yes	yes	" ----	----	----	----	----	"	no	1709
"	"	----	----	----	----	----	----	4 00	no	no	" ----	----	----	----	----	"	yes	1710
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	1711
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	1712
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	1713
"	----	----	----	----	----	----	----	----	----	----	" ----	----	----	----	----	"	"	1714
"	no	----	----	----	----	----	----	7 00	----	----	" ----	----	----	----	----	"	no	1715
"	----	----	----	----	----	----	----	----	no	no	" ----	----	----	----	----	"	yes	1716
	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	1717
	no	----	----	----	----	----	----	8 00	"	yes	" ----	----	----	----	----	"	"	1718
	"	----	----	----	----	----	----	6 00	"	no	" ----	----	----	----	----	"	"	1719
"	"	----	----	----	----	----	----	----	yes	"	" ----	----	----	----	----	"	"	1720
"	----	----	----	----	----	----	----	----	"	yes	" ----	----	----	----	----	"	"	1721
"	no	----	----	----	----	----	----	6 00	no	no	" ----	----	----	----	----	"	"	1722
"	"	----	----	----	----	----	----	7 00	yes	"	" ----	----	----	----	----	"	"	1723
"	yes	no	cont.	500	7	yes	yes	----	no	yes	" ----	----	----	----	----	"	"	1724
"	"	yes	----	----	----	----	"	----	yes	no	----	yes	yes	----	no	"	"	1725
"	no	----	----	----	----	----	----	8 00	"	----	None ----	----	----	----	----	"	no	1726
"	yes	no	mort.	400	7	yes	yes	----	"	no	" ----	----	----	----	----	"	yes	1727
"	no	----	----	----	----	----	----	8 00	"	yes	" ----	----	----	----	----	"	"	1728
"	"	----	----	----	----	----	----	7 00	no	no	" ----	----	----	----	----	"	"	1729
"	"	----	----	----	----	----	----	6 00	----	----	" ----	----	----	----	----	"	"	1730
"	yes	yes	----	----	----	----	yes	----	yes	no	" ----	----	----	----	----	no	"	1731
"	no	----	----	----	----	----	----	6 00	"	yes	" ----	----	----	----	----	yes	"	1732
"	----	----	----	----	----	----	----	----	no	no	" ----	----	----	----	----	"	"	1733
"	no	----	----	----	----	----	----	4 50	"	"	" ----	----	----	----	----	"	"	1734
"	"	----	----	----	----	----	----	6 00	yes	"	" ----	----	----	----	----	"	"	1735
s-mo.	"	----	----	----	----	----	----	6 00	"	"	" ----	----	----	----	----	no	no	1736
"	"	----	----	----	----	----	----	4 00	"	"	" ----	----	----	----	----	yes	yes	1737
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	1738
"	no	----	----	----	----	----	----	6 00	"	yes	" ----	----	----	----	----	"	no	1739
"	yes	yes	----	----	----	----	yes	----	no	no	" ----	----	----	----	----	"	yes	1740
"	"	no	mort.	300	7	yes	"	----	yes	"	" ----	----	----	----	----	"	"	1741
"	no	----	----	----	----	----	----	6 00	"	"	" ----	----	----	----	----	no	"	1742
"	"	----	----	----	----	----	----	8 00	"	"	" ----	----	----	----	----	yes	"	1743
wk.	"	----	----	----	----	----	----	6 00	----	yes	" ----	----	----	----	----	"	no	1744
"	----	----	----	----	----	----	----	----	yes	no	" ----	----	----	----	----	"	yes	1745
"	----	----	----	----	----	----	----	----	----	----	" ----	----	----	----	----	"	"	1746
"	----	----	----	----	----	----	----	----	----	----	" ----	----	----	----	----	"	"	1747
"	----	----	----	----	----	----	----	----	----	----	" ----	----	----	----	----	"	"	1748
"	no	----	----	----	----	----	----	8 00	----	----	" ----	----	----	----	----	"	"	1749
"	----	----	----	----	----	----	----	----	----	----	" ----	----	----	----	----	"	"	1750

Book No. 36. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1751	Pontiac	19	Am.	----	s	--	--	Blacksmith	day	10	no	$1 41	54	Sickness	$365	$75
1752	"	34	"	----	m	2	--	"	"	10	"	2 25	48	Lack of work	596	150
1753	"	27	"	----	s	--	--	"	"	10	"	1 40	12	Vacation	421	none
1754	"	21	"	----	"	--	--	"	"	10	"	1 40	24	"	405	------
1755	"	30	"	----	"	--	--	"	"	10	"	1 50	24	Lack of work	434	none
1756	"	43	Can.	19	m	2	5	"	"	10	"	2 25	10	Vacation	682	"
1757	"	22	Am.	----	s	--	--	"	"	10	"	1 41	10	Pleasure	427	50
1758	"	17	"	----	"	--	--	"	pc.	10	"	1 00	none	--------------	313	------
1759	"	55	"	----	m	2	2	"	day	10	"	1 63	48	Lack of work	432	none
1760	"	32	"	----	"	2	2	"	wk.	10	"	1 50	36	" "	415	"
1761	"	22	"	----	s	--	--	"	day	10	"	1 25	50	" "	329	"
1762	"	49	"	----	m	2	3	"	"	10	"	1 25	60	" "	316	"
1763	"	28	"	----	"	2	3	"	"	10	"	1 50	14	" "	449	"
1764	"	37	Eng.	20	s	--	--	"	"	10	"	2 25	104	Sickness	470	"
1765	"	19	Am.	----	"	--	--	"	"	10	"	1 00	none	--------------	313	115
1766	"	22	"	----	"	--	--	"	pc.	10	yes	1 25	36	Sickness*	346	100
1767	"	20	"	----	"	--	--	"	day	10	"	1 00	12	Pleasure*	301	none
1768	"	25	"	----	"	--	--	"	"	10	no	1 00	10	Sickness	303	"
1769	"	38	Scot.	17	m	2	2	"	"	10	"	2 50	6	--------------	768	------
1770	Ionia	25	Am.	----	s	--	--	"	"	10	"	2 00	50	Sickness	526	none
1771	"	56	"	----	m	2	2	"	"	10	"	1 50	58	Lack of work	383	"
1772	"	26	"	----	"	2	--	"	"	10	"	2 25	60	" "	569	"
1773	"	17	"	----	s	--	--	"	"	10	"	1 75	58	" "	446	"
1774	"	21	"	----	"	--	--	"	"	10	"	1 75	51	" "	458	"
1775	"	26	"	----	"	--	--	"	"	10	"	1 50	48	" "	498	100
1776	"	26	Fr.	----	"	--	--	"	"	10	"	1 25	55	" "	322	none
1777	"	20	Ger.	----	m	2	1	"	"	10	"	1 75	60	" "	443	"
1778	"	33	Am.	----	"	2	--	"	"	10	"	1 25	60	" "	316	80
1779	"	48	"	----	"	2	1	"	"	10	"	1 25	48	" "	331	none
1780	"	47	"	----	w	1	2	"	"	10	"	1 75	136	Sickness	426	"
1781	"	27	"	----	m	2	--	"	"	10	"	1 75	50	Lack of work	460	"
1782	"	25	"	----	"	2	1	"	"	10	"	1 65	100	Sickness	351	"
1783	"	41	"	----	"	2	3	"	"	10	"	1 75	50	Lack of work	460	"
1784	"	48	Aus	26	"	2	1	"	"	10	"	1 75	48	" "	464	"
1785	"	35	Irish	22	"	2	1	"	"	10	"	1 40	56	" "	360	"
1786	"	45	Am.	----	"	2	6	"	"	10	"	1 50	48	" "	401	100
1787	"	32	"	----	"	2	1	"	"	10	"	3 00	5	Sickness	924	150
1788	"	37	"	----	"	3	--	"	"	10	"	1 00	60	Lack of work	253	50
1789	"	36	"	--	"	2	4	"	"	10	"	1 25	54	" "	324	none
1790	"	19	Ger.	10	s	--	--	"	"	10	"	1 15	48	" "	304	"
1791	"	41	Am.	----	m	2	3	"	"	10	"	1 75	60	" "	445	"
1792	"	24	"	----	"	2	1	"	"	10	"	1 75	90	" "	390	"
1793	"	40	Can.	17	"	2	2	"	pc.	10	"	1 75	12	" "	527	100
1794	Lansing	46	Ger.	30	"	4	1	"	day	10	"	2 35	41	" "	639	75
1795	"	38	Am.	----	"	3	4	"	"	10	"	1 95	60	" "	493	none
1796	"	45	"	----	"	4	4	"	"	10	"	2 40	56	" "	617	"
1797	"	37	Ger.	12	"	2	3	"	"	10	"	1 80	61	" "	454	"
1798	"	45	Am.	---	"	4	1	"	"	10	"	1 90	62	Other business*	477	"
1799	"	45	Can.	25	"	2	1	"	"	10	"	2 00	none	--------------	626	"
1800	"	34	"	14	"	2	--	"	"	10	"	2 00	1	Sickness	624	25

* And lack of work.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.											None					yes	yes	1751
"	no										"					"	"	1752
"											"					"	"	1753
"									yes		"					"	"	1754
"											"					"	"	1755
"	no							$9 00			"					"	"	1756
"									no	no	"					"	"	1757
"											"					"	"	1758
"	yes	no	mort.	$350	8	yes	yes		yes		"					"	no	1759
"	"	"	cont.	500	6	no	"				"					"	"	1760
											"					no	"	1761
wk.	yes	yes					yes		no	yes	"					yes	yes	1762
"	no							4 00			Royal Americans.	yes	no	no	yes	"	"	1763
"									no	no	None					"	"	1764
"									"	"	"					"	"	1765
"									"	"	"					"	"	1766
"									yes	"	"					no	"	1767
"									"	"	"					yes	no	1768
"	yes						yes		"		"					"	yes	1769
s-mo									no	no	"					"	no	1770
"	no							6 00	"	"	"					no	yes	1771
"	"							6 00	yes	"	"					yes	"	1772
"									no	"	"					"	"	1773
"									"	"	"					"	"	1774
"									yes	yes	"					"	"	1775
"									no	no	"					"	"	1776
"	no								yes	yes	"					"	"	1777
"	"							4 00	no	no	"					"	"	1778
"	yes	yes					yes		yes	"	"					"	"	1779
"	no							3 50	no	"	"					"	"	1780
"	"							5 00	yes	"	"					"	"	1781
"	"							6 00	no	"	"					no	"	1782
"	"							7 00	yes	"	"					yes	"	1783
"	"							4 50	"	"	"					"	no	1784
"	"							6 00	no	"	"					"	yes	1785
"	yes	no	cont.	800	7	yes	yes		"	"	"					"	"	1786
"	no							10 00	"	"	"					"	no	1787
"	"							5 00	"	"	"					"	yes	1788
"	"							8 00	"	"	"					"	"	1789
"									"	"	"					"	"	1790
"	no							10 00	"	"	"					no	"	1791
"	"							5 00	"	"	"					"	"	1792
"	"							6 00	"	"	"					yes	"	1793
"	yes	yes							yes	"	"					"	no	1794
"	no							7 00	no	"	"					"	"	1795
"	"							8 00	yes	"	"					"	yes	1796
"	yes	no	mort.	200	7	no	yes		"	"	"					"	"	1797
"	"	"	"	500	7	yes	"		"	"	"					"	"	1798
"	"	"	"	800	8	no	"		no	"	"					"	"	1799
"	no							8 00		yes	"					"	"	1800

Book No. 37.

Table No. 1.—Continued.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single.	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1801	Lansing	23	Ger.	5	m	2	1	Blacksmith	day	10	no	$2 00	25	Sickness*	$576	$75
1802	"	33	Am.	----	"	2	2	"	pc.	10	yes	1 50	13	"	450	75
1803	"	27	"	----	s	--	--	"	day	10	no	1 25	3	Other work	388	25
1804	"	28	Can.	7	"	--	--	"	"	10	"	1 25	90	Lack of work	279	none
1805	"	36	Eng.	30	m	2	3	"	"	10	"	2 00	12	" "	602	"
1806	"	26	Am.	----	s	--	--	"	"	10	"	1 85	10	" "	406	30
1807	"	49	Ger.	43	m	2	4	"	"	10	"	2 00	90	" "	446	none
1808	Marshall	42	Can.	----	"	2	2	"	"	10	"	2 25	60	" "	568	"
1809	Charlotte	62	"	15	"	2	1	"	"	10	yes	2 25	30	" "	636	"
1810	"	42	"	15	"	2	2	"	pc.	10	"	2 25	60	" "	569	"
1811	"	53	"	30	"	3	3	"	"	10	"	2 00	60	" "	506	"
1812	"	47	Am.	----	"	2	3	"	day	10	"	1 50	60	" "	379	50
1813	"	41	"	----	s	--	--	"	pc.	10	"	1 50	90	" "	334	none
1814	"	40	"	----	m	2	3	"	wk.	10	"	1 75	30	" "	495	"
1815	Ovid	34	"	----	"	2	2	"	pc.	10	no	2 00	156	Other work	312	"
1816	"	--	Can.	----	"	2	1	"	day	10	"	2 25	100	" "	479	"
1817	"	40	Am.	----	s	--	--	"	yr.	10	"	3 00	none	----------	939	400
1818	"	26	"	----	m	2	--	"	day	10	"	1 25	104	Other work	261	none
1819	"	31	Eng.	27	"	3	--	"	pc.	10	"	2 25	20	" "	434	"
1820	"	31	Am.	----	s	--	--	"	day	10	----	1 60	88	" "	359	"
1821	Three Rivers	31	"	----	m	2	2	"	"	10	no	1 33	13	" "	400	50
1822	" "	54	"	----	"	2	2	"	"	10	"	1 65	none	----------	516	------
1823	" "	36	"	----	"	2	--	"	"	10	"	1 15	40	Lack of work*	314	none
1824	" "	65	"	----	"	2	--	"	"	10	"	1 83	6	" "	562	100
1825	" "	45	"	----	"	2	2	"	"	10	"	1 75	60	----------	443	------
1826	" "	43	"	----	"	3	--	"	pc.	10	"	1 25	118	Sickness	250	------
1827	" "	40	"	----	"	2	1	"	day	10	"	2 00	8	----------	610	------
1828	" "	29	"	----	s	--	--	"	"	10	yes	1 50	178	Lack of work	202	none
1829	" "	28	Hol.	----	m	2	2	"	"	10	no	1 50	100	" "	320	"
1830	Wayne	32	Am.	----	"	2	1	"	pc.	10	yes	2 25	30	" "	637	"
1831	"	20	"	----	s	--	--	"	"	10	no	1 25	30	" "	354	"
1832	"	31	"	----	m	2	2	"	"	10	"	1 35	90	" "	300	"
1833	"	38	"	----	s	--	--	"	day	10	yes	1 35	60	" "	342	"
1834	"	21	"	----	"	--	--	"	"	10	"	1 00	30	" "	283	"
1835	"	22	"	----	"	--	--	"	pc.	10	"	1 35	30	" " *	382	"
1836	"	35	"	----	m	2	3	"	day	10	"	1 35	20	" "	396	------
1837	"	24	"	----	s	--	--	"	pc.	10	"	1 15	30	" "	325	25
1838	"	32	Can.	9	m	2	1	"	day	10	"	1 35	3	" "	382	none
1839	Jonesville	36	Am.	----	"	2	1	"	pc.	10	"	1 75	25	" "	504	"
1840	"	16	"	----	s	--	--	"	day	10	"	58	12	Sickness	175	"
1841	"	20	"	----	"	--	--	"	"	10	"	91	6	" *	279	80
1842	"	30	"	----	m	2	2	"	"	10	"	1 50	10	Lack of work	455	none
1843	"	25	Ger.	----	s	--	--	"	"	10	"	1 00	60	----------	253	"
1844	"	38	"	19	m	2	1	"	"	10	"	1 50	10	Sickness	455	"
1845	"	26	Am.	----	"	2	--	"	"	10	"	1 50	25	"	432	"
1846	"	18	Eng.	17	s	--	--	"	"	10	"	83	none	----------	260	"
1847	"	18	Am.	----	"	--	--	"	pc.	10	"	1 00	90	Lack of work	223	"
1848	"	42	"	----	m	2	--	"	day	10	"	1 75	60	" "	443	"
1849	Marshall	36	Can.	16	"	2	2	"	"	10	"	2 25	12	Sickness	677	"
1850	"	48	"	30	"	3	--	"	pc.	10	----	1 75	90	"	390	100

* And pleasure.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance.	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	yes	no	cont.	$300	7	yes	yes	------	no	no	None	----	----	----	----	yes	yes	1801
"	"	"	mort.	200	7	"	"	------	yes	"	"	----	----	----	----	"	"	1802
"	"	yes	------	------	----	----	"	------	no	yes	"	----	----	----	----	"	"	1803
"	"	no	mort.	150	7	yes	"	------	"	no	"	----	----	----	----	"	"	1804
"	"	"	cont.	400	8	"	"	------	yes	"	"	----	----	----	----	"	"	1805
"	"	yes	------	------	----	----	"	------	no	"	"	----	----	----	----	"	"	1806
"	"	no	mort.	450	7	yes	"	------	"	yes	"	----	----	----	----	"	"	1807
"	no	----	------	------	----	----	----	------	----	----	"	----	----	----	----	"	"	1808
"	"	----	------	------	----	----	----	7 00	no	no	"	----	----	----	----	no	no	1809
"	"	----	------	------	----	----	----	7 00	"	"	"	----	----	----	----	"	"	1810
"	yes	yes	------	------	----	----	yes	------	"	"	"	----	----	----	----	yes	yes	1811
"	"	"	------	------	----	----	"	------	yes	"	"	----	----	----	----	"	"	1812
"	----	----	------	------	----	----	----	------	"	yes	"	----	----	----	----	"	"	1813
"	yes	yes	------	------	----	----	yes	------	"	no	"	----	----	----	----	"	"	1814
s-mo.	no	----	------	------	----	----	----	5 00	"	"	"	----	----	----	----	"	"	1815
"	"	----	------	------	----	----	----	------	"	yes	"	----	----	----	----	"	"	1816
"	----	----	------	------	----	----	----	------	no	no	"	----	----	----	----	"	"	1817
"	no	----	------	------	----	----	----	3 00	----	----	"	----	----	----	----	"	"	1818
"	yes	no	cont.	300	8	yes	yes	------	yes	no	"	----	----	----	----	"	"	1819
"	no	----	------	------	----	----	----	4 00	"	"	"	----	----	----	----	"	no	1820
"	yes	no	cont.	100	7	yes	yes	------	no	"	"	----	----	----	----	"	yes	1821
wk.	"	yes	------	------	----	----	"	------	"	----	"	----	----	----	----	"	"	1822
"	no	----	------	------	----	----	----	4 00	"	yes	"	----	----	----	----	"	"	1823
"	yes	yes	------	------	----	----	yes	------	"	no	"	----	----	----	----	"	"	1824
"	"	no	mort.	625	6	yes	"	------	----	----	"	----	----	----	----	"	"	1825
"	"	"	"	300	6	"	"	------	no	no	"	----	----	----	----	----	no	1826
"	no	----	------	------	----	----	----	------	yes	"	"	----	----	----	----	yes	"	1827
"	----	----	------	------	----	----	----	------	----	----	"	----	----	----	----	"	yes	1828
"	no	----	------	------	----	----	----	4 00	----	----	"	----	----	----	----	"	"	1829
s-mo.	"	----	------	------	----	----	----	6 00	----	----	"	----	----	----	----	"	"	1830
"	----	----	------	------	----	----	----	------	----	----	"	----	----	----	----	"	"	1831
"	no	----	------	------	----	----	----	5 00	----	----	"	----	----	----	----	"	"	1832
"	----	----	------	------	----	----	----	------	----	----	"	----	----	----	----	"	"	1833
"	----	----	------	------	----	----	----	------	----	----	"	----	----	----	----	"	"	1834
"	----	----	------	------	----	----	----	------	----	----	"	----	----	----	----	"	"	1835
"	no	----	------	------	----	----	----	5 00	----	----	"	----	----	----	----	"	"	1836
"	----	----	------	------	----	----	----	------	----	----	"	----	----	----	----	"	"	1837
"	no	----	------	------	----	----	----	7 00	----	----	"	----	----	----	----	"	"	1838
"	yes	yes	------	------	----	----	yes	------	no	no	"	----	----	----	----	"	no	1839
"	----	----	------	------	----	----	----	------	"	"	"	----	----	----	----	"	yes	1840
"	----	----	------	------	----	----	----	------	"	"	"	----	----	----	----	"	no	1841
"	no	----	------	------	----	----	----	6 00	yes	"	"	----	----	----	----	"	yes	1842
"	"	----	------	------	----	----	----	5 00	no	"	"	----	----	----	----	"	"	1843
"	yes	yes	------	------	----	----	yes	------	yes	"	"	----	----	----	----	"	no	1844
"	no	----	------	------	----	----	----	4 00	no	"	"	----	----	----	----	"	yes	1845
"	"	----	------	------	----	----	----	4 00	"	"	"	----	----	----	----	"	"	1846
"	----	----	------	------	----	----	----	------	"	"	"	----	----	----	----	no	no	1847
"	no	----	------	------	----	----	----	------	yes	"	"	----	----	----	----	yes	yes	1848
"	"	----	------	------	----	----	----	6 00	----	----	"	----	----	----	----	"	"	1849
wk.	yes	no	mort.	950	7	yes	yes	------	yes	no	"	----	----	----	----	"	"	1850

Book No. 38.

Table No. 1.—Continued.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1851	Marshall	23	Am	----	s	..	..	Blacksmith.	pc.	10	no	$1 50	15	Lack of work*	$447	none
1852	"	20	"	----	"		..	"	"	10	"	1 00	6	Pleasure	307	$75
1853	"	21	"	----	"	..	..	"	"	10	"	1 50	30	Lack of work	425	-----
1854	"	36	"	----	m	2	2	"	day	10	"	3 00	5	Holidays	924	150
1855	"	34	Irish	----	s	..		"	"	10	"	1 50	60	Lack of work	379	none
1856	Manistee	43	"	15	m	2	2	"	"	10	"	2 50	2	----------	778	250
1857	"	40	"	17	"	2	3	"	"	10	"	3 83	none	----------	1,200	500
1858	"	..	Ger.	16	"	5	5	"	"	10	"	2 50	"	----------	783	none
1859	"	18	Pol.	16	s	..	..	"	wk.	10	"	1 00	"	----------	313	------
1860	"	15	Am.	----	"	..	..	"	day	10	"	50	130	At school	92	------
1861	"	23	Pol.	16	m	2	..	"	"	10	"	2 00	none	----------	626	150
1862	"	35	Am.	----	"	2	2	"	"	10	"	2 00	65	Lack of work	496	none
1863	"	48	"	----	"	2	5	"	"	10	"	2 50	90	Sickness	557	"
1864	"	45	"	----	"	2	7	"	"	10	"	2 50	60	"	632	"
1865	Saginaw	31	"	----	"	2	3	"	"	10	"	1 50	20	"	439	"
1866	"	44	"	----	w	1	8	"	"	10	"	2 50	none	----------	782	"
1867	"	47	Can.	20	m	2	1	"	pc.	10	"	1 25	78	Lack of work	304	"
1868	"	45	Am.	----	"	2	8	"	day	10	yes	1 50	10	Sickness	455	"
1869	"	41	"	----	"	2	1	"	"	10	no	1 00	156	Lack of work	157	"
1870	"	47	"	----	"	2	6	"	"	10	"	1 25	78	" "	291	"
1871	Owosso	38	"	----	"	2	4	"	"	8	"	1 80	80	" "	419	------
1872	"	21	"	----	"	2	..	"	"	10	yes	1 25	60	" "	316	none
1873	"	29	Can.	6	"	2	1	"	"	10	"	2 00	54	" "	518	"
1874	"	28	Am.	----	s	..	..	"	"	10	no	1 25	100	" "	266	"
1875	Bay City	32	Eng.	18	m	2	2	"	"	10	"	2 50	13	Vacation	750	"
1876	" "	19	Am.	----	s	..	..	"	"	10	"	1 25	60	Sickness	316	"
1877	" "	50	Ger.	42	m	5	5	"	"	10	"	2 00	283	Lack of work	60	"
1878	" "	27	Can.	17	s	..	..	"	"	10	---	1 35	30	" "	382	40
1879	Albion	60	Am.	----	m	2	5	"	"	10	no	1 50	30	" " *	425	------
1880	"	33	Can	11	"	2	1	"	"	10	"	1 35	30	" "	382	75
1881	"	38	Am.	----	"	2	2	"	"	10	"	2 25	20	----------	660	------
1882	"	37	"	----	"	2	..	"	"	10	"	1 50	30	Lack of work	425	------
1883	Coldwater	50	"	----	"	2	..	"	"	10	"	1 75	30	" "	495	none
1884	"	21	"	----	s	..	..	"	"	10	yes	1 00	36	" "	277	50
1885	"	19	"	----	"	..	..	"	wk.	10	no	1 00	60	Bad weather.	253	none
1886	"	29	"	----	m	2	..	"	pc.	13	yes	2 55	none	----------	800	100
1887	Linden	40	"	--	"	2	3	"	day	10	no	1 50	155	Lack of work	235	none
1888	"	43	"	----	"	2	5	"	"	10	"	2 00	110	" " *	406	"
1889	Traverse City	19	"	---	s	..		"	----	10	---	1 50	none	----------	470	200
1890	" "	32	Can.	12	m	2	1	"	day	10	no	2 00	182	Vacation	262	none
1891	" "	33	Boh.	26	"	3	..	"	"	10	"	2 00	24	Sickness	578	175
1892	Mt. Clemens	48	Ger.	43	"	2	8	"	"	10	"	2 00	30	Other business†	566	none
1893	"	24	Am.	----	"	2	..	"	"	10	"	1 00	102	Lack of work	210	"
1894	"	62	Ger.	49	"	2	2	"	"	10	"	2 00	60	" " *	566	"
1895	Battle Creek	26	Am.	----	"	2	5	"	"	10	yes	1 66	18	Laid off	486	"
1896	" "	30	"	----	"	2	..	"	"	10	"	1 50	18	Lack of work*	470	100
1897	" "	35	"	--	"	2	3	"	"	10	"	1 60	14	" "	478	none
1898	" "	20	"	----	s	..	..	"	"	10	"	1 41	12	" "	440	75
1899	" "	19	Ger.	---	"	..	..	"	"	10	"	1 12	13	" "	350	50
1900	" "	28	Irish	----	m	2	3	"	"	10	"	1 08	20	" "	316	none

* And sickness.
† And holidays.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.		----	----	----	----	----	----	----	no	no	None ----	----	----	----	----	yes	yes	1851
"	yes	no	cont.	$350	7	yes	no	----	"	"	" ----	----	----	----	----	"	"	1852
"	----	----	----	----	----	----	----	----	----	----	" ----	----	----	----	----	"	no	1853
"	no	----	----	----	----	----	----	----	----	----	" ----	----	----	----	----	"	yes	1854
"	----	----	----	----	----	----	----	----	----	----	" ----	----	----	----	----	"	"	1855
mo.	yes	no	mort.	1,100	7	yes	yes	----	yes	no	‡ ----	yes	yes	no	no	no	"	1856
----	"	"	"	400	8	"	"	----	"	----	None ----	----	----	----	----	yes	"	1857
wk.	"	----	----	----	----	----	"	----	"	no	" ----	----	----	----	----	----	----	1858
"	----	----	----	----	----	----	----	----	----	----	" ----	----	----	----	----	----	----	1859
"	----	----	----	----	----	----	----	----	----	----	" ----	----	----	----	----	----	----	1860
"	no	----	----	----	----	----	----	$6 00	----	----	" ----	----	----	----	----	----	----	1861
"	"	----	----	----	----	----	----	8 00	----	----	" ----	----	----	----	----	yes	yes	1862
"	"	----	----	----	----	----	----	6 50	----	----	" ----	----	----	----	----	"	"	1863
"	yes	no	mort.	50	7	yes	yes	----	yes	no	" ----	----	----	----	----	"	"	1864
"	"	"	"	500	6	"	"	----	no	"	" ----	----	----	----	----	"	"	1865
"	no	----	----	----	----	----	----	6 00	----	----	" ----	----	----	----	----	"	"	1866
s-mo.	"	----	----	----	----	----	----	2 75	yes	----	" ----	----	----	----	----	"	"	1867
"	"	----	----	----	----	----	----	4 00	"	no	" ----	----	----	----	----	no	no	1868
"	"	----	----	----	----	----	----	----	----	----	" ----	----	----	----	----	yes	yes	1869
"	yes	no	cont.	450	7	yes	yes	----	----	----	" ----	----	----	----	----	no	"	1870
wk	"	"	mort.	----	----	no	"	----	yes	no	" ----	----	----	----	----	yes	"	1871
"	no	----	----	----	--	----	----	----	----	----	" ----	----	----	----	----	"	"	1872
"	"	----	----	----	----	----	----	----	no	yes	" ----	----	----	----	----	"	"	1873
"	----	----	----	----	----	----	----	----	----	----	" ----	----	----	----	----	"	"	1874
"	no	----	----	----	----	----	----	8 00	yes	no	" ----	----	----	----	----	"	"	1875
"	----	----	----	----	----	----	----	----	no	"	" ----	----	----	----	----	"	"	1876
"	yes	yes	----	----	----	----	yes	----	yes	"	" ----	----	----	----	----	"	"	1877
"	----	----	----	----	----	----	----	----	"	"	B. of B. M. ----	no	no	no	yes	"	"	1878
"	no	----	----	----	--	----	----	20 00	"	"	None ----	----	----	----	----	"	"	1879
"	"	----	----	----	----	----	----	8 35	no	"	" ----	----	----	----	----	"	"	1880
"	"	----	----	----	----	----	----	9 00	yes	"	" ----	----	----	--	----	"	"	1881
"	"	----	----	----	----	----	----	7 00	----	----	" ----	----	----	----	----	"	"	1882
"	yes	yes	----	----	----	----	yes	----	no	no	" ----	----	----	----	----	"	"	1883
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	1884
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	1885
day	no	----	----	----	----	----	----	9 00	yes	"	" ----	----	----	----	----	"	"	1886
wk.	yes	no	mort.	150	8	yes	yes	----	----	----	" ----	----	----	----	----	----	----	1887
"	no	----	----	----	----	----	----	3 00	----	----	" ----	----	----	----	----	yes	yes	1888
"	----	----	----	----	----	----	----	----	----	----	" ----	----	----	----	----	----	----	1889
"	yes	yes	----	----	----	----	yes	----	no	----	" ----	----	----	----	----	no	no	1890
"	"	"	----	----	----	----	"	----	yes	no	" ----	----	----	----	----	"	----	1891
"	"	"	----	----	----	----	"	----	"	"	§ ----	no	yes	no	no	yes	no	1892
"	no	----	----	----	----	----	----	4 00	----	----	None ----	----	----	----	----	no	"	1893
"	"	----	----	----	----	----	----	9 00	yes	----	§ ----	no	yes	no	no	yes	"	1894
"	"	----	----	----	----	----	----	8 00	----	----	None ----	----	----	----	----	"	"	1895
"	"	----	----	----	----	----	----	8 00	----	----	" ----	----	----	----	----	no	"	1896
"	"	----	----	----	----	----	----	8 00	yes	no	" ----	----	----	----	----	yes	"	1897
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	1898
"	----	----	----	----	----	----	----	----	no	"	" ----	----	----	----	----	no	"	1899
"	no	----	----	----	----	----	----	6 00	"	"	" ----	----	----	----	----	yes	yes	1900

‡ Scandinavian Working Men's Society.
§ Donaldson Bros. Employés' Sick and Accident Benefit Association.

Book No. 39. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
1901	Iron Mount.	22	Ger.	----	s	--	--	Blacksmith.	day	10	no	$2 00	104	Sickness -----	$418	$100
1902	" "	34	------	----	"	--	--	"	"	10	----	2 50	none	----------------	783	none
1903	" "	22	Am.	----	"	--	--	"	"	10	yes	2 00	"	----------------	626	"
1904	White Pigeon	41	"	----	m	2	2	"	"	10	no	1 25	72	Lack of work*	301	"
1905	Allegan-----	36	"	----	"	2	1	"	"	10	"	2 00	12	Accident-----	602	"
1906	" -----	45	Ger.	27	"	2	2	"	wk	10	"	1 00	25	Sickness -----	388	"
1907	Monroe-----	27	"	----	s	--	--	"	day	10	"	1 75	13	Vacation-----	525	200
1908	" -----	53	"	----	m	3	2	"	"	10	yes	1 75	10	Sickness -----	530	------
1909	Wyandotte.	24	Am.	----	"	2	--	"	"	10	no	1 90	none	----------------	595	200
1910	"	43	Ger.	----	"	3	3	"	"	10	"	1 66	30	Lack of work	470	none
1911	Benton H'b'r	25	Am.	----	"	2	1	"	"	10	"	1 75	10	Other business.	530	200
1912	Escanaba --	21	Ger.	----	s	--	--	"	wk	10	yes	2 00	10	----------------	606	none
1913	Lapeer -----	36	Am.	----	m	2	--	"	day	10	no	1 50	5	Pleasure-----	467	"
1914	Northville--	34	"	----	"	2	1	"	"	10	"	1 60	18	Sickness -----	472	"
1915	Plymouth-	27	"	----	"	2	--	"	"	10	"	1 50	13	Lack of work	450	"
1916	Rochester--	39	"	----	"	2	3	"	"	10	yes	1 25	none	----------------	391	"
1917	Roseville---	20	Ger.	----	s	--	--	"	wk.	10	no	75	156	Lack of work	118	25
1918	Kalamazoo-	30	Am.	----	m	2	--	Painter-----	pc.	10	----	2 00	60	" "	506	100
1919	"	40	"	----	"	2	--	" -----	"	10	----	2 00	none	----------------	676	175
1920	"	23	Hol.	10	s	--	--	" -----	day	10	----	1 25	35	Lack of work	348	none
1921	"	45	Am.	----	m	2	--	" -----	pc.	10	----	2 00	30	" "	566	------
1922	"	25	Hol.	15	s	--	--	" -----	day	10	----	1 50	30	" "	425	100
1923	"	40	Am.	----	m	2	1	" -----	pc.	10	----	1 75	30	" "	495	75
1924	"	30	"	----	"	2	--	" -----	day	10	----	1 75	none	----------------	548	250
1925	"	38	Hol.	----	"	2	3	" -----	"	10	----	1 50	"	----------------	470	200
1926	"	45	Am.	----	"	2	5	" -----	"	10	----	1 75	30	Lack of work	495	50
1927	"	40	Hol.	22	"	2	4	" -----	pc.	10	----	1 75	14	" "	523	110
1928	"	26	Am.	----	"	2	1	" -----	day	10	----	1 75	30	" "	495	90
1929	"	38	"	----	"	2	--	" -----	pc.	10	----	2 00	90	" "	446	100
1930	"	25	Hol.	10	s	--	--	" -----	"	----	----	1 50	60	" "	380	100
1931	"	35	Can.	15	m	2	1	" -----	"	10	----	2 00	60	" "	506	150
1932	"	45	Am.	----	"	2	2	" -----	"	10	----	1 50	45	" "	402	none
1933	"	25	Hol.	---	s	--	--	" -----	day	10	----	1 25	30	" "	354	"
1934	"	25	"	20	m	2	1	" -----	pc.	10	----	1 50	200	Sickness -----	170	------
1935	"	22	Am.	----	s	--	--	" -----	day	10	----	1 25	none	----------------	391	none
1936	"	30	Hol.	14	"	--	--	" -----	pc.	10	----	1 50	60	Lack of work	380	"
1937	"	30	Am.	----	m	2	3	" -----	"	10	----	1 50	60	" "	380	50
1938	"	21	"	----	s	--	--	" -----	"	10	----	1 50	60	" "	380	50
1939	"	19	"	----	"	--	--	" -----	day	10	----	1 00	60	" "	253	none
1940	"	25	"	----	"	--	--	" -----	"	10	----	1 25	60	" "	316	"
1941	"	30	"	----	m	2	--	" -----	"	10	----	1 25	35	" "	348	50
1942	"	25	Hol.	20	s	--	--	" -----	"	10	----	1 25	60	" "	316	none
1943	"	45	Am.	----	"	--	--	" -----	pc.	10	----	2 00	60	" "	506	100
1944	"	21	Hol.	6	"	--	--	" -----	day	10	----	1 00	60	" "	253	100
1945	"	19	Ger.	----	"	--	--	" -----	"	10	----	1 25	35	" "	348	none
1946	"	18	Hol.	12	"	--	--	" -----	pc.	10	----	1 25	30	" "	354	50
1947	"	28	"	20	"	--	--	" -----	day	10	----	1 50	none	----------------	470	100
1948	"	29	Am.	----	"	2	1	" -----	pc.	10	---	1 75	30	Lack of work	495	110
1949	"	22	Hol	4	"	--	--	" -----	day	10	----	1 25	35	" "	348	------
1950	"	24	Scot.	16	"	--	--	" -----	"	10	----	1 50	30	" "	425	125

* And sickness

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
dem.											None							1901
											"							1902
mo.	no							$5 00			"					no	yes	1903
s-mo.	yes	no					yes		no		"					yes	"	1904
wk.	no							10 00	yes	yes	"					no	no	1905
"	yes	yes							"		"					yes	yes	1906
"											"					"	no	1907
"	yes	yes					yes		yes		*		yes			"	yes	1908
"	no							7 00		yes	None					"		1909
"	yes	no	mort.	$180	7	no	yes		yes	no	"					"	yes	1910
"	"	"	"	400	8	yes	"		no	"	"					no	no	1911
"											"						"	1912
"	no							6 00	yes	no	"					yes	"	1913
"	"							6 00			"					"	"	1914
"	"							5 00	no	no	"					"	yes	1915
"	yes	no	mort.	340	7	yes	yes		yes	"	"					"	"	1916
"											"					"	"	1917
mo.	yes	yes					yes				"					"	"	1918
"	no							8 00	yes		"					"	"	1919
"											"					no	no	1920
"	no							9 00			"					yes	yes	1921
"									yes		"					no	no	1922
"	no							8 00			"					yes	yes	1923
"	"							6 00			"					no	no	1924
"	yes	yes					yes				"					"	"	1925
"	no							6 00			"					yes	yes	1926
"	yes	yes					yes		yes		"					"	"	1927
"	no							7 50			"					"	"	1928
"	yes	yes					yes		no		"					"	"	1929
"											"					no	no	1930
"	yes	yes					yes		yes		"					"	"	1931
"	"	"					"		"		"					"	"	1932
"											"					"	"	1933
"	yes	yes					yes				"					"	"	1934
"											"					yes	yes	1935
"									yes		"					no	no	1936
"	yes	yes					yes				"					yes	yes	1937
"											"					"	"	1938
"											"					"	"	1939
"											"					"	"	1940
"	no							7 00			"					"	"	1941
"											"					no	no	1942
"									yes		"					yes	yes	1943
"											"					no	no	1944
"											"					"	"	1945
"											"					"	"	1946
"									yes		"					"	"	1947
"	no							6 50			"					"	yes	1948
"									yes		"					"	no	1949
"											"					"	"	1950

* Workingmen's Benevolent Society.

Book No. 41. **Table No. 1.—CONTINUED.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
2001	Kalamazoo.	25	Am.	---	s	--	--	Painter.....	pc.	10	no	$1 75	50	Lack of work	$460	$50
2002	"	27	"	---	"	--	-	" ----	"	10	"	1 25	75	" "	298	none
2003	"	30	"	----	"	--	--	" ----	"	10	"	1 75	90	" "	390	15
2004	"	30	"	----	"	--	--	" ----	"	10	----	2 00	30	" "	566	100
2005	"	18	"	----	"	--	--	" ----	"	10	no	1 25	50	" "	328	10
2006	"	28	"	----	"	--		" ----	"	10	"	2 00	50	" "	526	110
2007	"	40	Hol.	30	m	2	2	" ----	"	10	"	2 00	90	" "	446	5
2008	"	20	"	15	s	--	--	" ----	"	10	"	1 00	150	" "	163	none
2009	"	24	Am.	----	"	--	--	" ----	"	10	"	1 75	50	" "	455	25
2010	"	30	"	----	m	2	--	" ----	day	10	"	3 00	none	------ ---------	939	300
2011	"	23	Hol	20	s	.	--	" ----	"	10	----	1 50	60	Lack of work	380	none
2012	"	18	Am	----	"	--	--	" ----	"	10	----	75	30	" "	217	"
2013	"	16	"	----	"	--	--	" ----	"	10	----	75	none	----------------	235	"
2014	"	50	"	----	m	3	1	" ----	"	10	----	1 75	60	Lack of work	443	"
2015	"	38	"	----	s	--	--	" ----	pc.	10	---	2 00	90	" "	336	"
2016	"	28	"	----	m	2	4	" ----	"	10	----	2 25	60	" "	569	100
2017	"	27	"	----	s	--	--	" ----	"	10	----	1 50	40	" "	410	50
2018	"	26	"	----	"	--	--	" ----	"	10	----	1 00	20	" "	293	25
2019	"	39	"	----	m	2	2	" ----	"	10	----	2 00	60	" "	506	none
2020	"	34	"	----	s	--	--	" ---	"	10	----	2 50	90	" "	558	"
2021	"	33	"	----	m	2	2	" ----	day	10	----	1 95	60	" "	493	"
2022	"	31	"	----	s	--	--	" ----	"	10	----	1 50	90	" "	334	"
2023	"	36	"	----	"	--	--	" ----	"	10	----	2 25	60	" "	569	"
2024	"	41	"	----	w	1	--	" ----	"	10	----	2 00	60	" "	506	"
2025	"	22	"	---	s	--	--	" ----	"	10	----	2 00	90	" "	336	"
2026	"	22	"	---	m	2	--	" ---	"	10	----	1 60	90	" "	357	"
2027	"	21	"	----	s	--	--	" ----	pc.	10	----	1 75	90	" "	390	"
2028	"	22	"	----	"	--	--	" ---	day	10	----	1 25	60	" "	316	"
2029	"	20	"	----	"	--	--	" ----	pc.	10	no	1 50	60	" "	380	"
2030	"	39	"	---	"	-	--	" ----	day	10	"	3 00	30	" "	759	200
2031	"	35	"	---	"	--	--	" ----	"	10	----	1 50	30	" "	425	none
2032	"	34	"	----	m	2	1	" ----	pc.	10	----	1 75	60	" "	443	"
2033	"	20	"	----	s	--	--	" ----	"	10	----	1 50	90	" "	335	50
2034	"	18	"	----	"	--	-	" ----	day	10	----	90	90	" "	255	none
2035	"	26	Hol.	20	m	2	2	" ----	pc.	10	----	1 60	90	" "	357	75
2036	"	19	Am.	---	s	--	--	" ----	day	10	no	1 10	150	" "	179	none
2037	"	30	"	----	m	2	1	" ----	"	10	----	2 00	156	" "	314	"
2038	"	17	"	---	s	--	-	" ----	"	·10	no	1 00	156	" "	157	"
2039	"	48	Neth	14	m	2	5	" ----	pc.	10	"	2 00	60	" "	506	"
2040	"	18	Am.	----	s	--	--	" ----	day	10	"	75	150	" "	122	"
2041	"	34	"	----	"	--	--	" ----	pc.	10	"	2 00	150	" "	326	10
2042	"	26	"	----	"	--	.	" ----	day	10	----	1 50	200	" "	170	none
2043	"	24	"	----	"	--	-	" ----	"	10	----	1 25	150	" "	203	"
2044	"	30	Hol.	----	"	-	-	" ----	"	10	----	75	150	" "	122	"
2045	"	38	Am.	----	m	2	--	" ----	pc.	10	----	2 00	150	" "	326	"
2046	"	25	"	----	s	--	--	" ----	day	10	no	1 25	150	" "	203	"
2047	"	28	"	----	m	2	1	" ----	"	10	"	1 50	none	----------------	470	125
2048	"	26	"	---	"	2	--	" ----	"	10	----	1 50	150	Lack of work	245	none
2049	"	30	Can.	5	"	2	1	" ----	pc.	10	no	2 00	none	----------------	626	100
2050	"	40	Am.	----	s	--	--	" ----	"	10	----	2 00	200	Lack of work	226	none

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.											None					yes	no	2001
"											"					no	"	2002
"									no		"					yes	"	2003
"											"					no	"	2004
"											"					yes	yes	2005
"											"					no	no	2006
"	no							$6 00			"					yes	yes	2007
"											"					no	no	2008
"											"					yes	yes	2009
"	no								no		"					"	"	2010
"									yes		"					no	no	2011
"											"					yes	yes	2012
"											"					"	"	2013
"	yes	yes					yes		no		"					"	"	2014
"									"		"					"	"	2015
"	yes	yes					yes				"					"	"	2016
"											"					"	"	2017
"									no		"					"	"	2018
"	yes	yes					yes		yes		"					"	"	2019
"											"					"	"	2020
"	yes	yes					yes		yes		"					"	"	2021
"									"		"					"	"	2022
"									"		"					"	"	2023
"									"		"					"	"	2024
"											"					"	"	2025
"	no										"					"	"	2026
"											"					"	"	2027
"											"					"	"	2028
"											"					"	"	2029
"									yes		"					"	"	2030
"									"		"					"	"	2031
"	no							7 50			"					"	"	2032
"											"					"	"	2033
"											"					"	"	2034
"	yes	yes					yes		yes		"					"	"	2035
"											"					"	"	2036
mo.	yes	no	cont	$575	7	yes	yes				"					"	"	2037
wk.											"					"	"	2038
"	yes	no	mort.	350	7	yes	yes		no		C. & W. M. U.				yes	"	"	2039
s-mo.											"					"	"	2040
"									yes		"				yes	"	"	2041
"									no		None					"	"	2042
"											"					"	"	2043
"									yes		"					no	no	2044
"	no							7 00			"					"	"	2045
"									no		"					yes	yes	2046
"	no										"					no	no	2047
"	"										"					"	"	2048
"	"							8 00			"					"	"	2049
"											C. & W. M. U.	no			yes	yes	yes	2050

Book No. 43. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
2101	Kalamazoo.	16	Am.		s			Painter	day	10	no	$1 00	60	Lack of work	$253	$10
2102	"	24	"		"			"	"	10	"	1 25	90	" "	279	none
2103	"	19	"		"			"	pc.	10	"	1 00	10	" "	303	15
2104	"	26	"		"			"	"	10	"	2 10	20	" "	586	175
2105	"	36	"		m	2	2	"	"	10	"	1 66	10	" "	503	50
2106	Jackson	27	Eng.	4	"	2	3	"	day	10	yes	1 50	30	" "	425	none
2107	"	33	"	1	"	2	3	"	"	10	no	2 00	none		626	50
2108	"	36			"	2	1	"	pc.	10	"	2 25	6	Lack of work	691	100
2109	"	23	Am.		s			"	"	10	"	1 25	none		391	40
2110	"	32	"		m	2	1	"	"	10	yes	2 25	"		704	50
2111	"	18	Eng.	12	s			"	"	10	no	1 25	"		391	18
2112	"	20	Am.		m	2		"	"	10	"	1 25	"		391	10
2113	"	24	"		s			"	day	10	"	1 50	"		470	40
2114	"	21	"		m	2		"	"	10	"	1 50	"		470	none
2115	"	24	"		s			"	"	10	"	1 50	10		453	"
2116	"	20	"		"			"	pc.	10	"	2 50	none		783	30
2117	"	27	"		m	2		"	"	10		2 50	"		783	25
2118	"	23	"		s			"	"	10		1 50	"		470	60
2119	"	21	"		m	2		"	"	10	no	1 50	6	Lack of work	460	35
2120	"	24	"		"	2		"	"	10	yes	1 66	60	" "	420	none
2121	"	22	"		s			"	"	10	no	1 50	none		470	"
2122	"	32	Eng.	10	m	2	1	"	day	10	"	2 50	"		783	100
2123	"	35	Am.		"	2	1	"	pc.	10	"	1 25	"		391	none
2124	"	17	Ger.	12	s			"	day	10	"	1 00	"		313	"
2125	"	30	Eng.	7	m	2		"	pc.	10	"	2 50	6	Lack of work	768	100
2126	"	32	Ger.		"	2	2	"	day	10	"	2 50	none		783	none
2127	"	36	Am.		"	2	1	"	pc.	10	"	2 00	"		626	"
2128	"	19	Ger.		s			"	day	10	"	1 20	"		376	15
2129	"	29	Am.		m	2	1	"	"	10	"	1 50	"		470	none
2130	"	23	"		s			"	"	10	"	1 50	"		470	"
2131	"	30	Swe.	15	"			"	"	10	"	1 50	6	Sickness	461	"
2132	"	46	Am.		m	4	4	"	pc.	10	"	1 50	60	Lack of work	380	"
2133	"	41	"		"	4	3	"	day	10	"	1 50	30	" "	425	"
2134	"	19	"		s			"	pc.	10	"	1 66	30		470	"
2135	"	23	"		"			"	day	10	"	1 70	none		532	"
2136	"	22	"		"			"	"	10	"	1 50	30		425	25
2137	"	19	Ger.		"			"	"	10	"	1 25	15	Sickness	373	25
2138	"	18	Am.		"			"	"	10	"	75	none		234	13
2139	"	54	Swe.	30	m	2	1	"	"	10	"	1 00	6	Lack of work*	307	none
2140	"	21	Am.		s			"	pc.	10	"	1 50	60	" "	380	"
2141	"	19	"		"			"	"	10	"	1 50	30	" "	425	25
2142	"	33	Irish	30	m	2		"	"	10	"	1 75	none		548	none
2143	"	23	Am.		s			"	"	10	"	1 50	"		470	"
2144	"	16	Ger.	13	"			"	day	10	"	75	"		235	"
2145	"	22	Am.		m	2		"	"	10	"	1 50	"		470	"
2146	"	45	"		s			"	pc.	10	"	1 40	40		382	"
2147	"	21	"		"			"	day	10	"	1 50	none		470	"
2148	"	36	Ger.	18	m	2	5	"	pc.	10	"	2 50	"		783	100
2149	"	25	Am.		s			"	"	10	"	2 00	90	Lack of work	446	
2150	"	44	"		m	2	1	"	"	10		2 75	30	" "	778	100

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.											None					no	no	2101
"									yes		"					yes	yes	2102
"											"					"	"	2103
"									no		"					"	"	2104
"	yes	yes					yes				"					"	"	2105
"	no							$3 00			"					"	"	2106
"	"							9 00	no	no	"					no	no	2107
"	yes	yes					yes		"	"	"					yes	yes	2108
"									"	"	"					"	"	2109
"	no							6 00	yes	"	"					"	"	2110
"											"					"	"	2111
"	no								no	no	"					"	"	2112
"									"	"	"					"	"	2113
"	no							8 00	yes	"	"					"	"	2114
"									no	"	"					"	"	2115
"									"	"	"					"	"	2116
"	yes	no	cont.	$500	7	yes	yes		yes	"	"					"	"	2117
"									no	"	"					"	"	2118
"	no								yes	"	"					"	"	2119
"	"								no	"	"					"	"	2120
"									"	"	"					"	"	2121
"	yes	yes					yes		yes	"	"					"	"	2122
"	no							7 00	no	"	"					"	"	2123
"									"	"	"					"	"	2124
"	no							8 00	yes	"	"					"	"	2125
"	"							11 00	"	"	"					"	"	2126
"	yes	no	mort.		7	yes	yes		"	"	"					"	"	2127
"									no	"	"					"	"	2128
"	no							8 00	yes	"	"					"	"	2129
"									no	"	"					"	"	2130
"									"	"	"					no	no	2131
"	no							12 00	"	"	"					yes	yes	2132
"	"							10 00	yes	"	"					"	"	2133
"									no	"	"					"	"	2134
"									"	"	"					no	"	2135
"									"	"	"					yes	"	2136
"									"	"	"					"	"	2137
"									"	"	"					"	"	2138
"	yes	yes					yes		yes	"	"					"	"	2139
"									no	"	"					"	"	2140
"									"	"	"					"	"	2141
"	no							9 00	"	"	"					"	"	2142
"									"	"	"					"	"	2143
"									"	"	"					no	no	2144
"	no							4 00	"	"	"					yes	yes	2145
"									"	"	"					"	"	2146
s-mo.											"					"	"	2147
"	yes	yes									"					no	no	2148
"									yes	no	"					yes	yes	2149
"	no							9 00	"	"	"					"	no	2150

Book No. 45. **Table No. 1.**—CONTINUED.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
2201	Jackson	2[illegible]	Am.	----	m	2	--	Painter	day	10	yes	$1 50	45	Lack of work	$40[illegible]	none
2202	“	26	Ger.	11	“	2	--	“	“	10	“	1 40	60	“ “	354	“
2203	“	28	Wel.	----	“	2	1	“	“	10	“	2 25	47	Sickness	600	“
2204	“	34	Eng.	9	s	--	--	“	pc.	10	“	2 25	30	“	700	$200
2205	“	25	Am.	----	m	2	--	“	day	10	“	1 40	15	Laid off	413	------
2206	“	27	“	----	“	2	1	“	“	10	“	1 25	60	Lack of work	316	none
2207	“	35	“	----	s	--	-	“	pc.	10	“	1 75	60	“ “	443	“
2208	“	32	“	----	m	2	1	“	day	10	“	1 00	32	Laid off	350	“
2209	“	33	“	----	s	--	--	“	pc.	10	no	1 25	183	Lack of work	163	“
2210	“	24	Eng.	17	“	--	--	“	“	10	yes	1 40	45	“ “	375	“
2211	“	18	Am.	----	“	--	--	“	day	10	“	83	250	Sickness	80	“
2212	“	28	Eng.	12	m	2	1	“	“	10	“	1 75	60	Laid off	443	“
2213	“	32	“	6	“	2	1	“	pc.	10	no	1 80	10	Sickness	545	70
2214	“	34	Am.	----	“	2	1	“	day	10	yes	1 66	none	----------------	520	200
2215	“	41	“	----	“	2	2	“	pc.	10	no	1 75	“	----------------	548	40
2216	“	28	“	----	s	--	--	“	day	10	“	1 75	5	Sickness	539	none
2217	“	38	“	----	“	--	--	“	“	10	“	1 65	none	----------------	516	75
2218	“	32	“	----	m	2	1	“	“	10	“	2 00	“	----------------	626	------
2219	“	29	“	----	“	2	--	“	“	10	yes	1 75	60	Laid off	400	none
2220	“	29	“	----	“	2	--	“	“	10	“	1 75	200	----------------	193	------
2221	“	33	“	---	w	1	1	“	wk.	10	“	1 50	40	Sickness	410	none
2222	“	50	Irish	45	m	2	--	“	“	10	“	1 50	50	“	400	------
2223	“	23	Am.	----	“	2	--	“	day	10	“	1 50	50	Lack of work	400	none
2224	“	24	“	----	s	--	--	“	“	10	“	1 65	75	“ “	400	“
2225	“	21	“	----	“	--	--	“	“	10	“	1 00	100	Sickness	213	50
2226	“	20	“	----	“	--	-	“	pc.	10	“	1 50	25	“ *	43[illegible]	50
2227	“	27	“	----	m	2	--	“	day	10	no	1 75	12	Lack of work	527	100
2228	“	23	“	----	“	2	-	“	pc.	10	“	1 50	none	----------------	470	none
2229	“	27	“	----	“	2	2	“	“	10	“	1 50	100	Lack of work	320	“
2230	“	19	“	----	s	2	3	“	“	10	“	1 40	2	“ “	435	30
2231	“	21	“	----	“	--	--	“	“	10	“	1 75	180	“ “	233	none
2232	“	23	“	----	m	2	1	“	“	10	“	1 50	18	Sickness	443	“
2233	“	23	“	----	“	2	-	“	“	10	“	1 25	none	----------------	391	100
2234	“	32	“	----	“	2	4	“	“	10	“	1 40	10	Sickness	424	none
2235	“	19	“	----	s	--	--	“	“	10	“	1 25	3	Lack of work	388	“
2236	“	21	“	----	“	--	-	“	“	10	“	1 50	60	“ “	380	“
2237	“	28	Ger.	12	m	2	5	“	“	10	“	1 25	2	“ “	389	“
2238	“	19	Am.	----	s	--	-	“	“	10	“	1 20	12	Sickness	361	40
2239	“	36	Eng.	33	m	2	--	“	“	10	“	1 25	none	----------------	391	none
2240	“	21	Ger.	----	“	2	-	“	“	10	“	1 50	100	Lack of work	320	“
2241	“	21	Am.	----	s	--	-	“	“	10	“	1 40	none	----------------	438	“
2242	“	28	“	----	m	2	1	“	“	10	“	1 50	6	Sickness	461	“
2243	“	35	“	----	s	--	--	“	“	10	“	1 50	none	----------------	470	“
2244	“	39	“	----	m	3	--	“	“	10	“	2 25	“	----------------	704	50
2245	“	27	“	----	“	2	-	“	“	10	yes	2 00	60	Lack of work	506	25
2246	“	23	“	----	s		--	“	day	10	no	1 75	90	“ “	390	200
2247	“	22	“	----	“	--	-	“	“	10	“	1 75	20	“ “	513	none
2248	“	45	“	----	m	2	1	“	pc.	10	“	1 20	90	“ “	268	“
2249	“	30	“	----	“	2	5	“	day	10	“	1 75	60	“ “	443	“
2250	“	26	“	----	“	2	--	“	pc.	10	“	2 25	2	Sickness	700	“

* And pleasure.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance.	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.	no							$8 00			None					yes	yes	2201
"	"							7 00	yes	no	"					"	"	2202
"	"								"	"	"							2203
"									"	"	"							2204
"	yes	no	cont	$900	7	yes	yes		"	"	"					no	no	2205
"	no							6 00	"	"	"					yes	"	2206
"											"					"	yes	2207
"	no							7 00	yes	no	"					"	"	2208
"									"	"	"					"	"	2209
"											"					"	no	2210
"											"					"	yes	2211
wk.	no							8 00	yes		"					"	"	2212
"	yes	no	cont.	350	7	yes	yes		no	no	"					"	"	2213
"	"	"	mort.	500	7	"	"		yes	"	"					"	"	2214
"	"	yes					"		"	"	"					"	"	2215
"									no	"	"					"	"	2216
"									"	"	P. & D. I. U.	yes	yes	yes	yes	"	"	2217
"	no								yes	"	None					"	"	2218
s-mo.	"							8 00	"	"	"					"	"	2219
"	"							8 00	"	"	"					"	"	2220
"	"										"					"	"	2221
"	yes	yes					yes		yes		"					"	"	2222
"	no							9 00			"					no	no	2223
"											"					yes	yes	2224
"											"					"	"	2225
wk.									no	no	"					"	"	2226
"	yes	yes					yes		"	"	"					"	"	2227
"	no							5 00	"	"	"					"	"	2228
"	"							7 00	"	"	"					"	"	2229
"	"							9 00	"	"	"					"	"	2230
"									"	"	"					"	"	2231
"	yes	no	mort.	300	7	yes	yes		yes	"	J. O. U. A. M.					"	"	2232
"	no							7 00	no	"	None					"	"	2233
"	"							8 00	"	"	"					"	"	2234
"	"							10 00	"	"	"					"	"	2235
"									"	"	"					"	"	2236
"	yes	yes					yes		yes	"	"					"	no	2237
"									no	"	"					"	yes	2238
"	no							6 00	"	"	"					"	"	2239
"	"							5 00	"	"	"					"	"	2240
"									yes	"	"					"	"	2241
"	yes	no	cont.	500	7	yes	yes		no	"	"					"	"	2242
"									"	"	"					"	"	2243
"	no							9 00	"	"	"					"	"	2244
"	"							10 00	"	"	"					"	"	2245
"									"	"	"					"	"	2246
"									"	"	"					"	"	2247
"	no							8 00	yes	"	"					"	"	2248
"	yes	no	mort	110	7	yes	yes		"	"	"					"	"	2249
"	no								no	"	"					"	"	2250

Book No. 46. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
2251	Jackson ----	35	Am.	----	w	1	3	Painter ----	day	10	no	$1 25	15	Sickness------	$373	none
2252	" ----	34	"	----	s	--	--	" ----	"	10	"	1 25	10	Lack of work	379	"
2253	" ----	30	"	----	"	--	--	" ----	pc.	10	"	2 00	none	----------------	626	"
2254	" ----	34	"	----	m	2	1	" ----	"	10	"	2 00	"	----------------	626	"
2255	" ----	30	"	----	"	2	2	" ----	"	10	"	2 00	"	----------------	626	$80
2256	" ----	31	Irish	----	"	2	2	" ----	"	10	"	1 50	20	Lack of work	440	60
2257	" ----	21	Can.	----	s	--	--	" ----	"	10	yes	2 00	none	----------------	626	75
2258	" ----	21	Am	----	"	--	--	" ----	"	10	no	1 75	25	Sickness. ----	504	50
2259	" ----	24	Irish	----	"		--	" ----	day	10	"	1 50	60	Lack of work	380	none
2260	" ----	38	Am.	----	m	2	--	" ----	wk.	10	yes	3 00	none	----------------	939	300
2261	" ----	28	"	----	s	--	--	" ----	pc.	10	no	2 00	"	----------------	626	175
2262	" ----	29	"	----	m	2	--	" ----	day	10	"	1 75	"	----------------	548	100
2263	" ----	32	Ger.	----	"	2	2	" ----	pc.	10	"	1 75	"	----------------	548	100
2264	" ----	32	Am.	----	"	2	2	" ----	day	10	"	1 50	"	----------------	470	none
2265	" ----	47	Can.	----	"	3	1	" ----	pc.	10	"	1 25	30	Sickness------	354	"
2266	" ----	28	Eng.	2	s	--	--	" ----	"	10	"	1 50	none	----------------	470	"
2267	" ----	27	Am.	----	m	2	1	" ----	"	10	"	1 40	120	Lack of work	270	"
2268	" ----	27	"	----	s	--	--	" ----	"	10	"	1 75	10	" "	530	50
2269	" ----	35	"	----	m	2	--	" ----	day	10	"	1 50	30	" "	425	none
2270	Detroit-----	19	"	----	s	--	--	" ----	"	10	"	1 25	63	" "	312	"
2271	" -----	18	"	----	"	--		" ----	"	10	"	75	43	" " *	202	"
2272	" -----	50	"	----	m	2	5	" ----	"	10	"	1 75	100	" "	392	"
2273	" -----	50	"	----	"	2	6	" ----	"	10	"	2 00	157	" "	312	"
2274	" -----	46	Fr.	----	s	--	--	" ----	"	10	"	2 00	157	" "	312	"
2275	" -----	21	Ger.	11	"	--	--	" ----	"	10	"	1 00	73	Laid off------	240	"
2276	" -----	40	Am.	----	m	2	2	" ----	"	10	yes	1 75	60	Lack of work	443	70
2277	" -----	27	Fr.	13	s	--	--	" ----	"	10	"	2 00	none	----------------	626	75
2278	" -----	21	Can.	4	"	--	--	" ----	"	10	no	1 20	60	Lack of work	304	none
2279	" -----	21	Am.	----	"	--	--	" ----	"	10	"	1 40	30	" "	396	"
2280	" -----	45	Irish	25	"	--	--	" ----	"	10	"	1 50	none	----------------	470	------
2281	" -----	28	Am.	----	"	--	--	" ----	"	10	"	2 00	"	----------------	626	200
2282	" -----	35	"	----	m	2	2	" ----	"	10	"	2 00	"	----------------	626	250
2283	" -----	36	"	----	"	2	1	" ----	"	10	----	2 00	20	Sickness------	586	225
2284	" -----	21	"	----	s	--	--	" ----	"	10	no	1 50	none	----------------	475	100
2285	" -----	26	"	----	"	--	--	" ----	"	10	"	1 25	"	----------------	391	none
2286	" -----	33	Ger.	----	m	2	3	" ----	"	10	"	1 25	"	----------------	391	"
2287	" -----	46	Am.	----	s	--	--	" ----	"	10	"	2 50	"	----------------	783	300
2288	" -----	24	Can.	22	m	2	--	" ----	"	10	"	1 25	"	----------------	391	none
2289	" -----	27	Am.	----	"	2	1	" ----	"	10	yes	2 00	12	Pleasure -----	602	75
2290	" -----	20	"	----	s	--	--	" ----	wk.	10	"	1 25	13	Sickness -----	375	none
2291	" -----	18	Jew	----	"	2	3	" ----	"	10	"	1 25	none	----------------	391	"
2292	" -----	49	Swiss	12	"	--	--	" ----	day	10	no	1 75	10	Pleasure -----	530	"
2293	" -----	25	Am.	----	m	2	2	" ----	"	10	----	1 50	none	----------------	469	------
2294	" -----	21	Can.	2	s	--	--	" ----	"	10	----	1 50	"	----------------	469	50
2295	" -----	20	Ger.	16	"	--	--	" ----	"	10	no	1 25	5	----------------	385	none
2296	" -----	28	Can.	8	"	--	--	" ----	"	10	"	2 00	none	----------------	626	50
2297	" -----	39	"	14	w	1	1	" ----	"	10	"	1 75	18	Pleasure *----	516	none
2298	" -----	32	Am.	----	s	--	--	" ----	"	10	"	2 00	25	----------------	576	------
2299	" -----	33	Ger.	15	"	--	--	" ----	wk.	10	"	1 88	18	Lack of work	524	------
2300	" -----	25	"	----	m	2	--	" ----	day	10	"	1 50	20	" "	440	------

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* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	no	----	----	----	----	----	----	$6 00	no	no	None	----	----	----	----	yes	yes	2251
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	2252
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	2253
"	yes	no	cont.	$800	7	yes	yes	----	yes	"	"	----	----	----	----	"	"	2254
"	"	"	"	500	7	"	"	----	"	"	"	----	----	----	----	"	"	2255
"	"	"	mort.	700	7	"	"	----	"	"	"	----	----	----	----	"	"	2256
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	2257
"	----	----	----	----	----	----	----	----	yes	"	"	----	----	----	----	"	"	2258
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	2259
"	yes	yes	----	----	----	----	yes	----	yes	"	"	----	----	----	----	"	"	2260
"	"	no	mort.	150	7	yes	"	----	"	"	"	----	----	----	----	"	"	2261
"	"	"	cont	150	7	"	"	----	no	"	"	----	----	----	----	"	"	2262
"	"	"	mort.	200	7	"	"	----	yes	"	"	----	----	----	----	no	no	2263
"	"	"	cont.	600	7	"	"	----	no	"	"	----	----	----	----	yes	yes	2264
"	no	----	----	----	----	----	----	10 00	yes	"	"	----	----	----	----	"	"	2265
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	2266
"	no	----	----	----	----	----	----	9 00	"	"	"	----	----	----	----	"	"	2267
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	2268
"	no	----	----	----	----	----	----	9 00	"	"	"	----	----	----	----	"	"	2269
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	2270
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	2271
"	yes	yes	----	----	----	----	yes	----	----	----	"	----	----	----	----	"	"	2272
"	"	no	mort.	125	7	no	"	----	----	----	"	----	----	----	----	"	"	2273
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	2274
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	no	no	2275
s-mo.	no	----	----	----	----	----	----	6 00	no	no	"	----	----	----	----	yes	"	2276
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	2277
wk.	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	yes	2278
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	2279
"	----	----	----	----	----	----	----	----	---	----	"	----	----	----	----	"	no	2280
"	----	----	----	----	----	----	----	--	----	----	"	----	----	----	----	"	"	2281
"	no	----	----	----	----	----	----	12 00	yes	no	"	----	----	----	----	"	"	2282
"	yes	yes	----	----	----	----	yes	----	"	"	"	----	----	----	----	"	"	2283
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	2284
s-mo.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	yes	2285
"	no	----	----	----	----	----	----	6 00	no	----	"	----	----	----	----	"	"	2286
"	----	----	----	----	----	----	----	----	"	----	"	----	----	----	----	"	"	2287
"	no	----	----	----	----	----	----	10 00	"	no	"	----	----	----	----	"	"	2288
wk.	"	----	----	----	----	----	----	10 00	yes	"	"	----	----	----	----	"	no	2289
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	2290
"	no	----	----	----	----	----	----	6 00	"	"	"	----	----	----	----	"	yes	2291
"	----	----	----	----	----	----	----	----	yes	----	"	----	----	----	----	"	"	2292
"	no	----	----	----	----	----	----	6 00	"	----	"	----	----	----	----	"	"	2293
"	----	----	----	----	----	----	----	----	"	----	"	----	----	----	----	"	"	2294
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	2295
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	2296
"	no	----	----	----	----	----	----	----	yes	yes	"	----	----	----	----	"	"	2297
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	2298
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	2299
"	no	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	no	2300

Book No. 48.

Table No. 1.—Continued.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
2351	Detroit	29	Am.	---	s		--	Painter	---	10	no	$1 50	60	Lack of work	$380	none
2352	"	27	"	----	m	2	1	"	pc.	10	"	2 00	30	" "	566	100
2353	"	27	"	----	"	2	1	"	"	10	"	2 00	30	" "	506	100
2354	"	21	"	---	s	--	--	"	"	10	"	1 50	30	" "	426	75
2355	"	29	"	----	"	--	--	"	"	10	"	1 50	60	" "	380	none
2356	"	26	"	----	"	-	--	"	"	10	"	2 00	none	----	626	150
2357	"	24	"	----	"	-	--	"	day	10	"	1 00	30	Lack of work	283	none
2358	"	21	"	---	"	--	--	"	pc.	10	"	1 00	60	" "	253	"
2359	"	25	"	---	"	--		"	"	10	"	2 00	60	" "	506	100
2360	"	30	"	----	m	2	1	"	"	10	"	2 00	30	" "	566	none
2361	"	22	"	----	s	--	--	"	"	10	"	1 50	60	" "	380	"
2362	"	27	"	---	"	--	--	"	"	10	"	2 00	none	----	626	100
2363	"	34	"	----	m	2	2	"	"	10	"	2 25	60	Lack of work	569	100
2364	"	33	"	----	"	2	1	"	"	10	"	2 25	none	----	704	200
2365	"	23	"	---	s	--	--	"	"	10	"	1 50	90	Lack of work	335	none
2366	"	22	"	----	"	--	--	"	"	10	"	2 00	60	" "	506	100
2367	"	21	"	----	m	2	--	"	"	10	"	1 50	none	----	470	none
2368	"	22	"	----	s	--	--	"	"	10	"	1 50	90	Lack of work	335	"
2369	"	24	"	---	"	--	.	"	"	10	"	1 50	60	" "	380	"
2370	"	28	"	----	m	2	1	'	"	10	"	2 00	90	" "	446	"
2371	"	21	"	----	s	--		"	"	10	"	1 25	30	" "	354	"
2372	"	41	"	----	m	2	3	"	"	10	"	1 50	60	" "	380	"
2373	"	23	"	---	s	--		"	"	10	"	1 50	none	----	470	150
2374	"	27	"	----	"	--	--	"	"	10	"	1 50	90	Sickness	335	none
2375	Flint	29	Can.	9	"	--	--	"	"	10	---	3 25	none	----	1,017	340
2376	"	21	Am.	---	"	--	--	"	"	10	no	1 50	52	Lack of work	377	none
2377	"	23	"	----	"	--	--	"	"	10	"	1 50	30	" "	425	"
2378	"	22	"	----	"	-	--	"	"	10	"	1 50	20	Vacation	440	"
2379	"	27	"	----	m	2	--	"	"	10	"	1 50	90	Lack of work	335	----
2380	"	17	"	---	s	--	-	"	"	10	"	75	120	" "	125	none
2381	"	21	Can	16	"	-	--	"	"	10	"	1 25	60	" "	316	"
2382	"	19	"	14	"	--	--	"	day	10	"	1 00	60	Vacation	253	"
2383	"	44	Am.	----	"	--	-	"	pc.	10	"	1 25	30	Lack of work	354	"
2384	"	26	"	----	"	--	--	"	"	10	"	1 75	90	" "	390	"
2385	"	32	"	----	m	2	1	'	"	10	"	1 50	90	" "	335	100
2386	"	30	"	-	"	2	1	"	"	10	"	1 50	30	" "	425	----
2387	"	32	Scot.	24	w	1	2	"	"	10	"	2 00	none	" "	626	100
2388	"	26	Irish	8	s	--	--	"	"	10	----	1 50	10	Vacation	455	60
2389	"	19	"	14	"	--	--	"	"	10	no	1 00	60	Lack of work	253	none
2390	"	34	Am.	---	m	2	--	"	"	10	yes	1 25	60	" " *	316	75
2391	"	48	"	----	"	2	2	"	"	10	"	1 75	25	Vacation	504	none
2392	"	33	"	----	s	--	--	"	day	10	"	1 50	25	"	432	45
2393	"	20	"	---	"	--	--	"	pc.	10	no	1 25	90	Lack of work	284	none
2394	"	16	"	----	"	--		"	wk	10	"	62	10	" "	188	"
2395	"	18	Can.	3	"	--	--	"	day	10	"	1 00	200	At school	113	"
2396	"	16	Am.	---	"	-	--	"	pc.	10	"	75	213	"	75	"
2397	"	22	Eng.	16	"	--	--	"	"	10	"	1 10	30	Lack of work	331	"
2398	"	37	Ger.	----	"	.	.	"	"	10	"	1 20	30	Other work	340	"
2399	"	30	Can.	8	m	2	2	"	"	10	yes	2 00	30	Lack of work	566	"
2400	"	50	Am.	----	"	2	1	"	"	10	no	1 00	150	" " *	163	"

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.									no	no	None					yes	yes	2351
"	no							$8 00	yes	"	"					"	"	2352
"	"							8 00	"	"	"					"	"	2353
"									no	"	"					"	"	2354
"									"	"	"					"	"	2355
"									"	"	"					"	"	2356
"									yes	"	"					"	"	2357
"									no	"	"					"	"	2358
"									"	"	"					"	"	2359
"	no							8 00	"	"	"					"	"	2360
"									"	"	"					"	"	2361
"									"	"	"					"	"	2362
"	no							10 00	"	"	"					"	"	2363
"	yes	yes							"	"	"					"	"	2364
"									"	"	"					"	"	2365
"									"	"	"					"	"	2366
"	no							8 00	yes	"	"					"	"	2367
"									no	"	"					"	"	2368
"									"	"	"					"	"	2369
"	no							10 00	yes	"	"					"	"	2370
"									no	"	"					"	"	2371
"	yes	yes							yes	"	"					"	"	2372
"									no	"	"					"	"	2373
"									"	"	"					"	"	2374
wk	yes	yes					yes		yes		"					"	"	2375
"									"	no	"					"	"	2376
"	yes	no	mort.			yes			no	"	"					"	"	2377
"	no							5 00			"					"	"	2378
"	"							6 00			"					"	"	2379
"											"					"	"	2380
"											"					"	"	2381
"											"					"	"	2382
"	no							8 00			"					"	"	2383
"	"							8 00	no	no	"					"	"	2384
"	yes	yes					yes		yes	"	"					"	"	2385
"	no							7 00	"	"	"					"	"	2386
"	"										"					"	"	2387
"											"					"	"	2388
"	no							5 00			"					"	no	2389
"	yes	no	cont.	$600	7	yes	no		yes		"					"	yes	2390
"	no							5 00	"	yes	"					"	"	2391
"											"					"	"	2392
"									ye-	no	"					"	"	2393
"									no	"	"					"	"	2394
"									yes	"	"					"	"	2395
"									no	"	"					"	"	2396
"									"	"	"					"	"	2397
"									"	"	"							2398
s-mo.	no							6 00	yes	"	"					yes	no	2399
wk.		yes					yes			yes	"					"	yes	2400

Book No. 50. **Table No. 1.**—CONTINUED.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
2451	Flint	19	Am.	----	s	--	--	Painter	day	10	no	$1.33	90	Lack of work	$297	none
2452	“	32	“	----	m	2	1	“	“	10	“	1 33	60	“ “	336	“
2453	“	36	Can.	17	s	--	--	“	“	10	yes	2 50	60	“ “	633	“
2454	“	20	“	3	“	--	--	“	“	10	no	1 13	90	Sickness	252	“
2455	“	21	Am.	----	“	--	--	“	“	10	yes	1 33	90	Pleasure	297	$125
2456	“	17	“	----	“	--	--	“	“	10	no	83	7	Lack of work*	254	none
2457	“	28	“	----	m	2	1	“	pc.	10	“	2 25	none	----------	704	100
2458	“	18	“	----	s	--	--	“	day	10	“	82	90	Lack of work	183	none
2459	“	17	“	----	“	--	--	“	“	10	“	75	90	“ “	167	“
2460	“	16	“	----	“	--	--	“	“	10	“	75	100	“ “	159	“
2461	“	18	“	----	“	--	--	“	“	10	“	75	30	“ “	212	“
2462	“	45	Ger.	23	“	--	--	“	pc.	10	yes	1 50	2	----------	466	“
2463	“	24	Am.	----	m	2	--	“	“	10	no	2 00	36	Lack of work	554	“
2464	“	22	“	----	“	2	--	“	day	10	“	1 33	12	“ “	400	“
2465	“	18	“	----	s	--	--	“	“	10	“	1 00	120	“ “	193	“
2466	“	17	“	----	“	--	--	“	“	10	----	1 00	90	----------	223	“
2467	“	38	“	----	m	2	2	“	“	10	yes	1 50	18	Lack of work	443	“
2468	“	25	“	----	“	2	--	“	“	10	no	1 25	60	“ “	315	“
2469	“	36	“	----	“	2	-	“	“	10	yes	1 35	90	“ “	301	“
2470	“	31	“	----	s	--	--	“	“	10	“	1 25	60	“ “	316	“
2471	“	25	“	----	“	--	--	“	“	10	“	1 25	60	“ “	316	50
2472	“	30	“	----	“	--	--	“	“	10	“	1 50	60	“ “	380	50
2473	“	21	“	----	“	--	--	“	“	10	“	1.25	7	“ “	382	none
2474	“	21	Can.	2	“	--	--	“	“	10	“	1 42	48	“ “	376	25
2475	“	23	Am.	----	“	--	--	“	“	10	“	2 00	21	“ “	584	25
2476	“	21	“	----	“	--	--	“	“	10	“	1 50	120	“ “	290	none
2477	“	22	“	----	m	2	--	“	“	10	“	1 50	60	“ “	380	“
2478	“	21	“	----	s	--	--	“	pc.	10	“	2 00	7	“ “	612	25
2479	Pontiac	32	“	----	m	2	1	“	day	10	“	2 25	none	Sickness	704	100
2480	“	18	Eng.	----	s	--	--	“	pc.	10	no	1 00	40	Lack of work	278	none
2481	“	35	Am.	----	m	2	--	“	wk.	10	“	1 75	40	Sickness	477	100
2482	“	22	Fr.	----	s	--	--	“	pc.	10	“	2 00	30	Lack of work	566	none
2483	“	32	Hol.	----	m	2	1	“	“	10	“	2 00	60	“ “	506	“
2484	“	26	Can.	16	“	2	--	“	“	10	yes	1 40	160	“ “ *	214	“
2485	“	26	Am.	----	s	--	--	“	“	10	“	1 25	175	“ “	172	25
2486	“	25	Can.	1	“	--	--	“	“	10	“	1 00	235	Other work	78	20
2487	“	22	Am.	----	“	--	--	“	“	10	no	1 75	45	Lack of work	469	none
2488	“	25	“	----	m	2	--	“	“	10	“	1 25	72	“ “	301	“
2489	“	23	“	----	“	2	--	“	“	10	“	1 00	72	“ “	241	“
2490	“	25	“	----	“	2	--	“	“	10	“	1 10	48	“ “	292	“
2491	“	15	“	----	s	--	--	“	day	10	“	60	48	----------	159	“
2492	“	21	“	----	“	--	--	“	pc.	10	“	1 50	48	Sickness	398	50
2493	“	35	“	----	m	2	1	“	day	10	“	2 50	42	“	678	none
2494	“	17	“	----	s	--	--	“	pc.	10	“	75	48	Lack of work	199	25
2495	“	28	Can.	27	m	2	--	“	“	10	“	1 00	96	Sickness	217	none
2496	“	23	“	7	s	--	--	“	“	10	“	1 50	48	Lack of work	398	“
2497	“	21	Am.	----	“	--	--	“	“	10	“	75	48	“ “	199	“
2498	“	17	“	----	“	--	--	“	“	10	“	85	72	“ “	205	“
2499	“	21	“	----	m	2	--	“	“	10	“	1 00	72	“ “	241	45
2500	“	21	Can.	4	s	--	--	“	“	10	“	1 00	24	“ “	289	50

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.										no	None					yes	yes	2451
"	yes	no	mort.	$400	7	yes	yes		yes	"	"					"	"	2452
"									no	"	"					"	no	2453
"									"	"	"					"	"	2454
"										"	"					"	yes	2455
"										"	"					"	"	2456
"	yes	no	mort.	200	7	yes	yes		yes	"	"					"	no	2457
"									no	"	"					"	yes	2458
"									"	"	"					"	"	2459
"										"	"					"	"	2460
"									no	"	"					"	"	2461
"									yes	yes	"							2462
"	no							$8 00	no	no	"					yes	yes	2463
"	"							6 00		"	"					"	"	2464
"									no	"	"					"	"	2465
"										"	"					"	"	2466
"	no								yes	"	"					"	"	2467
"	"								no	"	"					"	"	2468
"	"								"	"	"					"	"	2469
"									"	"	"					"	"	2470
"									yes	"	"					"	"	2471
"									"	"	"					"	"	2472
"									no	"	"					"	"	2473
"									yes	"	"					"	"	2474
"									no	"	"					"	"	2475
"									"	"	"					"	"	2476
"	no							6 00	"	"	"					"	"	2477
"									"	"	"					"	"	2478
"	no							8 00	yes	"	"					"	"	2479
"									no	"	"					no	no	2480
"	no							9 00	yes	"	"					yes	yes	2481
"									no	"	"					"	"	2482
"	no								"	"	"					"	"	2483
"	"							8 00	"	"	"					"	"	2484
"									"	"	"					"	"	2485
"									"	"	"					"	"	2486
"									yes	"	"					"	no	2487
"	no							7 50	no	"	"					yes	yes	2488
"	"							4 00			"					"	"	2489
"	"							5 00	no	no	"					"	"	2490
"									"	"	"					"	"	2491
"									"	"	"					"	"	2492
"	yes	yes							yes		"					"	"	2493
"									no	no	"					"	"	2494
"	no								"	"	"					"	"	2495
"									"	"	"					"	"	2496
"									"	"	"					"	"	2497
"									"	"	"					"	"	2498
"	no							3 50	"		"					"	"	2499
"											"					"	"	2500

Book No. 52. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
2551	Charlotte	29	Am.	----	s	--	--	Painter	pc.	10	yes	$1 00	100	Lack of work	$218	none
2552	"	22	"	----	m	2	1	"	"	10	no	75	100	" "	159	"
2553	"	19	Can.	3	s	--	--	"	"	10	yes	60	100	" "	127	"
2554	"	17	Am.	----	"	--	--	"	"	10	"	50	100	" "	106	"
2555	"	19	"	----	"	--	-	"	"	10	no	1 00	90	" "	223	"
2556	"	18	"	----	"	--	--	"	wk.	10	"	50	60	" "	126	$15
2557	"	18	"	----	"	-	--	"	"	10	"	67	90	" "	149	15
2558	"	24	"	----	"	-	--	"	day	10	"	1 00	30	" "	283	50
2559	"	22	"	----	"	-	--	"	"	10	"	1 00	60	" "	253	35
2560	"	19	"	----	"	--	--	"	wk	10	"	67	60	" "	169	none
2561	"	25	"	----	"	--	--	"	day	10	yes	1 25	60	" "	316	"
2562	"	26	"	----	m	2	1	"	pc.	10	"	1 75	60	" "	443	"
2563	Lansing	38	Can.	13	"	2		"	"	10	no	1 50	75	" "	357	"
2564	"	31	Am.	----	"	2	1	"	"	10	"	1 25	90	" "	279	"
2565	"	31	Can.	30	"	2		"	"	10	"	1 50	200	" "	170	"
2566	"	29	Am.	----	"	2	1	"	"	10	"	1 50	35	" "	417	"
2567	"	46	"	----	"	2	6	"	"	10	"	1 50	120	" "	290	"
2568	"	38	"	----	s			"	"	10	"	1 50	120	" "	290	"
2569	"	51	"	----	m	2	4	"	day	10	"	2 00	10	Pleasure	606	200
2570	"	42	"	----	"	2	2	"	pc	10	"	1 50	66	Lack of work	370	none
2571	"	47	"	----	"	2	1	"	day	10	"	2 00	6	Pleasure	614	"
2572	"	49	"	----	"	2	2	"	pc.	10	"*	1 50	40	Sickness*	410	"
2573	"	28	Can.	22	"	2		"	"	10	"	1 50	180	Lack of work	200	"
2574	"	40	Am.	----	s	--	--	"	"	10	"	1 00	90	" "	223	"
2575	"	22	"	----	m	2	1	"	"	10	"	1 25	90	" "	279	100
2576	"	40	"	----	"	2	4	"	"	10	yes	2 00	90	" "	446	none
2577	"	25	"	----	s	--	--	"	"	10	no	1 50	160	" "	230	"
2578	"	28	"	----	"	--	--	"	day	10	"	1 50	30	" "	425	80
2579	"	49	Ger.	30	w	4	2	"	"	10	"	2 35	42	" "	637	none
2580	"	20	Am.	----	s	--	--	"	"	10	"	75	90	" "	167	"
2581	"	43	"	----	m	3	--	"	pc.	10	"	1 50	37	" "	414	"
2582	"	18	"	----	s	--	--	"	"	10	"	1 20	15	" "	358	25
2583	"	47	Ger.	22	m	4	5	"	"	10	"	1 25	63	" "	312	none
2584	"	36	"	14	"	2	3	"	day	10	"	1 25	50	" "	329	"
2585	"	40	"	14	"	2	3	"	pc.	10	"	1 28	58	" "	326	"
2586	"	24	"	14	"	2	2	"	day	10	"	1 30	50	" "	342	"
2587	"	20	"	14	s	--	--	"	pc	10	"	1 25	50	Sickness	329	"
2588	"	22	Am.	----	"	--	--	"	"	10	"	1 75	36	Lack of work	485	50
2589	"	27	"	----	"	--	--	"	"	10	"	1 40	45	" "	375	30
2590	"	25	"	----	"	--	--	"	"	10	"	1 75	90	" "	390	none
2591	"	29	"	----	"			"	hr.	10	"	2 25	36	" "	623	150
2592	"	53	Ger.	14	m	4	--	"	day	10	"	1 15	70	" "	279	none
2593	G'd Rapids	23	Can.	9	"	2	--	"	"	10	"	1 33	78	" "	313	"
2594	"	30	Pol.	24	"	2	1	"	"	10	"	1 50	52	" "	391	"
2595	"	45	Ger.	40	"	2	4	"	pc.	10	"	1 75	26	" "	502	50
2596	"	36	Hol.	28	"	2	5	"	day	10	"	1 80	12	" "	542	36
2597	"	40	"	23	"	2	1	"	"	10	"	1 78	26	Pleasure*	511	50
2598	"	40	Can.	16	"	2	6	"	"	10	yes	2 50	none	----------	817	100
2599	"	40	Am.	----	"	2	2	"	pc.	10	no	2 50	104	Lack of work	523	100
2600	"	17	"	----	s	--	--	"	day	10	"	1 00	104	" "	209	none

* And lack of work.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.									yes	yes	None					yes	yes	2551
"	no							$4 00	no	no	"					"	"	2552
"									"	"	"					no	no	2553
"									"	"	"					yes	yes	2554
"									yes	yes	"					"	"	2555
"									no	no	"					"	no	2556
"									"	"	"					"	"	2557
"										yes	"					"	"	2558
"										"	"					"	"	2559
"									no	no	"					"	"	2560
"										yes	"					"	"	2561
"	no							7 00	yes	no	"					"	yes	2562
"	"							7 00	"	"	"					"	"	2563
"	"							6 00	no	"	"					"	"	2564
"	"							7 00	yes	"	"					"	"	2565
"	"							6 00	"	"	"					"	"	2566
"	"							10 00			"					"	"	2567
"											"					"	"	2568
"	yes	no	cont.	$1,000	7	no	yes		yes	no	"					"	"	2569
"	"	yes					"		"	"	"					"	"	2570
"	no								"	"	"					"	"	2571
"	yes	yes					yes		"	"	"					"	"	2572
"	no							5 00	no	"	"					"	"	2573
"									"	"	"					"	"	2574
"	no								"	"	"					"	"	2575
"	yes	yes					yes		yes	"	"					"	"	2576
"									no	"	"					"	"	2577
s-mo.									"	"	"					"	"	2578
"	yes	yes					yes		yes	"	"					"	"	2579
"											"					"	"	2580
"	no							8 33	yes	no	"					"	no	2581
"									no	"	"					"	yes	2582
"	yes	yes					yes		"	"	"					no	no	2583
"	"	"					"		yes	"	"					"	"	2584
"	"	no	mort.	200	7	no	"		no	"	"					yes	yes	2585
"	no							6 00	yes	"	"					no	"	2586
wk.										"	"					yes	"	2587
s-mo.									no	"	"					"	"	2588
"									"	"	"					"	no	2589
"									"	"	"					"	yes	2590
"											"					"	"	2591
"	yes	yes					yes		yes	no	"					"	"	2592
wk.	no							7 00	no	"	"					"	"	2593
"	"							4 50	"	"	"					"	"	2594
"	yes	no	mort.	500	7	yes	yes		yes	"	"					"	"	2595
"	"	"	cont.	600	8	"	"		"	"	"					"	"	2596
"	"	"	mort.	475	7½	"	"		no	"	"					"	"	2597
"	"	"	"	750	7	"	"		yes	"	"					"	"	2598
"	"	"	"	400	7	"	"				"					"	no	2599
"									no	no	"					"	yes	2600

Book No. 53. **Table No. 1.**—CONTINUED.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
2601	G'd Rapids.	37	Am.	----	m	2	2	Painter ----	day	10	no	$2 50	6	Pleasure ----	$767	$300
2602	"	18	"	----	s	--	--	" ----	"	10	"	1 00	26	Sickness ----	287	none
2603	"	17	"	----	"	--	--	" ----	pc.	10	"	1 25	none	----	391	"
2604	"	20	"	----	"	--	--	" ----	wk.	10	"	1 25	90	Lack of work	279	"
2605	"	27	"	----	m	2	1	" ----	day	10	"	2 25	90	" "	502	"
2606	"	46	"	----	"	2	4	" ----	pc.	10	"	1 23	none	----	391	"
2607	"	29	"	----	"	2	--	" ----	day	10	"	1 50	36	Sickness ----	416	"
2608	"	50	Can.	31	"	2	4	" ----	pc.	10	"	2 50	none	----	782	"
2609	"	28	Am.	----	s	--	--	" ----	day	10	"	1 50	90	Lack of work	335	"
2610	"	55	"	----	m	2	1	" ----	"	10	"	90	114	" "	179	"
2611	"	57	Hol.	14	w	1	1	" ----	"	10	"	1 00	70	" "	243	"
2612	"	28	Can.	----	m	2	4	" ----	pc.	----	"	1 50	100	" "	320	"
2613	"	50	Hol.	7	"	2	4	" ----	day	10	"	1 00	130	" "	183	"
2614	"	30	Am.	----	"	2	1	" ----	pc.	10	"	1 50	78	" "	352	"
2615	"	26	"	----	"	2	--	" ----	"	10	"	1 50	66	" "	378	"
2616	"	56	"	----	"	2	5	" ----	day	10	"	1 75	104	" "	366	"
2617	"	28	"	----	"	2	2	" ----	pc.	10	"	1 50	48	" "	398	"
2618	"	46	"	----	"	2	--	" ----	"	10	"	1 50	52	" "	391	"
2619	"	33	Can.	10	"	2	4	" ----	"	10	"	1 75	78	" "	411	"
2620	"	39	Hol.	23	"	2	4	" ----	"	10	"	1 60	65	" "	397	"
2621	"	50	"	6	"	2	4	" ----	day	10	"	1 00	78	" "	235	"
2622	"	56	"	7	"	2	2	" ----	"	10	"	1 00	60	" "	253	"
2623	"	36	Am.	----	"	2	2	" ----	pc.	10	"	1 75	54	" "	453	"
2624	Albion ----	46	"	----	"	2	2	" ----	day	10	"	1 50	15	----	447	----
2625	" ----	40	"	----	"	2	--	" ----	"	10	"	3 20	none	----	1,000	200
2626	" ----	36	Irish	----	s	--	--	" ----	"	10	"	1 40	30	Vacation ----	396	75
2627	" ----	29	Am.	----	m	2	1	" ----	"	10	"	1 50	90	Sickness ----	335	----
2628	" ----	24	"	----	s	3	--	" ----	"	10	"	1 50	120	Lack of work	290	----
2629	" ----	22	"	----	"	4	--	" ----	"	10	"	1 50	40	Sickness ----	410	none
2630	" ----	33	Irish	----	"	--	--	" ----	"	10	"	1 50	none	----	470	----
2631	" ----	59	Am.	----	m	3	--	" ----	"	10	"	1 35	4	----	417	----
2632	" ----	38	"	----	"	2	--	" ----	"	10	yes	1 50	40	Vacation ----	409	100
2633	" ----	36	Irish	----	"	2	2	" ----	"	10	no	1 75	20	----	513	----
2634	" ----	39	Am.	----	"	2	1	" ----	"	10	"	1 75	5	----	539	150
2635	" ----	61	"	----	"	2	--	" ----	pc.	10	"	1 50	235	Other work --	117	----
2636	" ----	30	Ger.	3	"	2	2	" ----	"	10	"	1 50	90	Laid off ----	335	----
2637	" ----	25	"	14	s	--	--	" ----	"	10	"	1 50	none	----	470	----
2638	" ----	26	Irish	----	"	--	--	" ----	"	10	"	2 00	10	----	606	200
2639	" ----	46	Am.	----	"	2	--	" ----	day	10	"	1 60	30	Sickness ----	453	50
2640	" ----	40	"	----	m	2	2	" ----	"	10	"	1 75	15	----	522	----
2641	" ----	34	Eng.	16	"	2	1	" ----	"	10	"	1 75	20	----	513	160
2642	" ----	26	Am.	----	s	--	--	" ----	pc.	10	"	1 50	20	Sickness ----	440	75
2643	" ----	28	"	----	m	3	2	" ----	day	10	"	1 75	15	----	522	50
2644	" ----	22	"	----	"	2	1	" ----	"	10	"	1 35	10	----	409	75
2645	" ----	32	Ger.	30	"	2	2	" ----	pc.	10	"	1 50	10	----	455	75
2646	" ----	24	Am.	----	"	2	--	" ----	day	10	"	1 75	10	----	530	250
2647	" ----	23	Irish	----	"	2	1	" ----	pc.	10	"	1 50	60	Sickness ----	380	15
2648	Ovid ----	19	Am	----	s	--	--	" ----	day	10	"	1 00	104	Other work --	209	none
2649	" ----	34	"	----	m	2	3	" ----	"	10	yes	1 25	75	Lack of work	296	"
2650	" ----	46	"	----	"	2	1	" ----	"	10	no	1 25	130	Other work --	228	"

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	yes	no	mort.	$600	7	yes	yes		yes	no	None					yes	yes	2601
"									"	"	"					"	"	2602
"									"	"	"					"	no	2603
"											"					"	yes	2604
"	no							$8 00			"					"	"	2605
"	yes	yes					yes		no	no	"					"	"	2606
"	no							4 00	"	"	"					"	"	2607
"	yes	yes					yes		"	"	"					"	"	2608
"									yes	"	"					"	"	2609
"	yes	no	mort.	200	8	yes	yes		no	"	"					"	"	2610
"	no								"	"	"					no	no	2611
"	"							6 00	"	"	"					yes	yes	2612
"	yes	no	cont.	500	7	yes	yes		"	"	"					no	no	2613
"	no							8 00	yes	"	"					yes	yes	2614
"	"							8 00	no	"	"					"	"	2615
"	"							8 00	"	"	"					"	"	2616
"	"							6 00	"	"	"					"	"	2617
"	"							6 00	yes	"	"					"	"	2618
"	yes	no	mort.	900	7	yes	yes		no	"	"					"	"	2619
"	"	"	cont.	900	7	"	"		"	"	"					"	"	2620
"	no							5 00	yes	"	"					"	"	2621
"	yes	no	cont.		6	yes	yes		no	"	"					"	"	2622
"	no							6 00	"	"	"					"	"	2623
"	"							8 00	yes	"	"					"	"	2624
"	yes	yes					yes		"	yes	"					"	"	2625
"									"		"					"	"	2626
"	no							7 00	no	no	"					"	"	2627
"	"							6 00			"					"	"	2628
"	yes	yes					yes		yes	yes	"					"	"	2629
"											"					"		3630
"	yes								yes	no	"					"	yes	2631
"	no								"		"					"	"	2632
"	yes	no	mort.	250	7	yes	yes		"		"					"	"	2633
"	no							11 00	"		"					"	"	2634
"	yes	yes					yes		"	no	"					"		2635
"	no							8 00			"					"	yes	2636
"											"					"	"	2637
"											"					"	"	2638
"	no							10 00		yes	"					"	"	2639
"	yes	no	mort.	200	7	yes	yes		yes		"					"	"	2640
"	no							9 00	no	no	"					"	"	2641
"										yes	"					"	"	2642
"	no							8 00	yes		"					"	"	2643
"	yes	no	mort.	500	7	yes	yes		"		"					"	"	2644
"	"	"	"	150	7	"	"				"					no	no	2645
"	no							6 50	no	no	"					yes	yes	2646
"	"								yes	yes	"					"	"	2647
e-mo.	"							4 00	no	no	"					"	"	2648
"	yes	yes					no		"	"	"					"	no	2649
"	"	"					yes		"	"	"					"	yes	2650

Book No. 54. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	**Amount saved in past year.**
2651	Ovid	28	Am.		m	2		Painter	day	10	no	$1 25	182	Other work	$151	**none**
2652	"	33	"		"	2	6	"	pc	10	"	1 50	104	" "	312	**"**
2653	"	20	"		s			"	"	10	"	1 30	130	" "	237	**"**
2654	"	40	"		m	2	1	"	"	10	yes	2 00	130	" "	366	**$150**
2655	"	41	Can.	18	"	2	1	"	"	10		2 50	130	" "	458	**150**
2656	"	40	Am.		"	2	2	"	"	10	no	2 00	125	" "	376	**none**
2657	"	38	"		"	3	3	"	day	10	"	2 50	18	Lack of work	738	**"**
2658	"	33	"		"	2	2	"	"	10	"	1 50	58	Sickness	383	**"**
2659	"	43	"		"	2	2	"	"	10	"	1 50	150	Other work	245	**"**
2660	"	38	"		"	2		"	pc.	10	"	2 00	120	" "	386	**"**
2661	Marshall	44	"		"	2	5	"	day	10	yes	2 25	20	Lack of work*	700	**"**
2662	"	30	"		"	2	1	"	"	10	"	1 50	21	" "	438	**"**
2663	"	21	"		s			"	pc.	10	no	1 35	30	" "	382	**100**
2664	"	16	"		"			"	day	10	"	40	6	Laid off	123	------
2665	"	43	"		m	2	2	"	"	10	"	3 00	20	Sickness	879	**none**
2666	"	17	Irish		s			"		10	"	75	30	Lack of work	495	**"**
2667	"	44	Am.		m	2	4	"	pc.	10	"	1 50	21	Sickness	438	**"**
2668	"	38	Ger.		"	2	1	"	"	10	"	1 75	20	Lack of work	513	**100**
2669	"	24	Am.		s			"	"	10	"	1 50	30	Sickness	425	**25**
2670	"	30	Irish		"			"	"	10	"	2 40	60	Lack of work	627	**150**
2671	"	20	"		"			"	"	10	"	1 25	60	" "	316	**none**
2672	"	39	Am.		m	2	1	"	"	10	"	2 00	60	" "	506	**"**
2673	Ionia	22	"		"	2		"	day	10	yes	1 30	50	" " *	342	**50**
2674	"	31	"		"	2	2	"	"	10	"	1 40	198	" "	161	**none**
2675	"	24	Ger.	6	"	2	2	"	"	10	no	1 30	156	" "	204	**"**
2676	"	27	Am.		"	2	1	"	"	10	"	1 35	30	" "	382	**15**
2677	"	60	"		"	2	1	"	"	10	"	1 25	50	" "	329	**none**
2678	"	66	"		"	2		"	"	10	"	1 25	60	" " *	316	**"**
2679	"	19	"		s			"	"	10	"	1 30	80	" "	302	**"**
2680	"	26	"		"	3		"	"	10	"	75	36	" "	210	**"**
2681	"	21	"		"			"	"	10	"	1 25	30	" "	354	**"**
2682	"	23	"		"			"	"	10	"	1 00	45	" "	268	**"**
2683	"	17	"		"			"	"	10	"	80	60	" "	202	**"**
2684	"	31	"		m	2	1	"	"	10	"	1 25	33	" " *	350	**35**
2685	"	47	"		"	2	1	"	"	10	"	1 12	62	" " *	281	**20**
2686	Jonesville	29	"		s	2		"	"	10	"	1 40	none		438	**none**
2687	"	28	"		m	2		"	"	10	"	1 50	20	Lack of work	440	**"**
2688	"	27	"		"	2	1	"	"	10	"	1 00	30	" " *	283	**"**
2689	"	17	"		s			"	"	10	"	50	none	" " *	147	**"**
2690	"	47	"		m	2	3	"	"	10	"	1 67	30	Other business	472	**"**
2691	"	25	"		"	2	1	"	"	10	"	1 75	30	Lack of work	495	**"**
2692	"	3	"		"	2		"	"	10	"	1 50	90	" " *	335	**20**
2693	"	20	Irish		s			"	"	10	"	1 50	30	" "	424	**75**
2694	"	35	Ger.		m	2	1	"	yr.	10	yes	2 80	none		876	**150**
2695	"	17	Am.		s			"	day	10	no	67	40	Lack of work	183	**none**
2696	"	27	"		m	2	1	"	"	10	"	2 00	10	" "	606	**100**
2697	"	19	"		s			"	"	10		83	none		260	**none**
2698	"	20	"		"			"	"	10		83	"		260	**"**
2699	"	19	"		"	4	3	"	"	10	no	58	35	Lack of work*	161	**"**
2700	"	19	"		"			"	"	10	"	1 33	90	" "	397	**"**

*** And sickness.**

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.	yes	no	mort.	$200	7	yes	no	----	yes	no	None	----	----	----	----	yes	yes	2651
“	no	----	----	----	----	----	----	$2 00	no	“	“	----	----	----	----	“	“	2652
“	----	----	----	----	----	----	----	----	“	“	“	----	----	----	----	“	“	2653
“	yes	yes	----	----	----	----	yes	----	“	“	“	----	----	----	----	“	no	2654
“	“	no	cont.	100	7	yes	“	----	yes	“	“	----	----	----	----	“	yes	2655
“	“	“	mort.	265	7	“	“	----	“	“	“	----	----	----	----	“	“	2656
“	“	yes	----	----	----	----	“	----	“	yes	“	----	----	----	----	“	“	2657
“	no	----	----	----	----	----	----	5 00	no	no	“	----	----	----	----	“	“	2658
“	“	----	----	----	----	----	----	5 00	----	----	“	----	----	----	----	“	“	2659
“	yes	no	mort.	100	8	yes	yes	----	yes	no	“	----	----	----	----	“	“	2660
wk.	“	“	“	500	7	“	“	----	“	“	“	----	----	----	----	“	“	2661
“	“	yes	----	----	----	----	“	----	“	“	“	----	----	----	----	“	no	2662
----	----	----	----	----	----	----	----	----	----	----	“	----	----	----	----	“	yes	2663
wk.	----	----	----	----	----	----	----	----	----	----	“	----	----	----	----	----	----	2664
----	no	----	----	----	----	----	----	----	----	----	“	----	----	----	----	yes	yes	2665
----	----	----	----	----	----	----	----	----	----	----	“	----	----	----	----	“	“	2666
wk.	yes	yes	----	----	----	----	----	----	yes	----	“	----	----	----	----	“	“	2667
“	“	no	mort.	400	6	yes	yes	----	----	----	“	----	----	----	----	“	no	2668
“	----	----	----	----	----	----	----	----	----	----	“	----	----	----	----	“	yes	2669
----	----	----	----	----	----	----	----	----	----	----	“	----	----	----	----	“	no	2670
wk.	----	----	----	----	----	----	----	----	----	----	“	----	----	----	----	“	yes	2671
----	no	----	----	----	----	----	----	----	----	----	“	----	----	----	----	“	“	2672
s-mo.	“	----	----	----	----	----	----	----	----	----	“	----	----	----	----	“	“	2673
“	“	----	----	----	----	----	----	----	----	----	“	----	----	----	----	“	“	2674
“	“	----	----	----	----	----	----	5 00	yes	no	“	----	----	----	----	no	no	2675
“	“	----	----	----	----	----	----	3 00	no	“	“	----	----	----	----	yes	yes	2676
“	“	----	----	----	----	----	----	12 00	----	----	“	----	----	----	----	“	“	2677
“	“	----	----	----	----	----	----	5 00	no	no	“	----	----	----	----	“	“	2678
“	yes	no	mort.	665	7	yes	yes	----	“	“	“	----	----	----	----	“	“	2679
“	no	----	----	----	----	----	----	2 00	----	----	“	----	----	----	----	“	“	2680
“	----	----	----	----	----	----	----	----	----	----	“	----	----	----	----	“	“	2681
“	----	----	----	----	----	----	----	----	----	----	“	----	----	----	----	“	“	2682
“	----	----	----	----	----	----	----	----	----	----	“	----	----	----	--	“	“	2683
“	yes	no	cont.	180	7	yes	no	----	----	----	“	----	----	----	----	“	“	2684
“	no	----	----	----	----	----	--	4 00	no	no	“	----	----	----	----	“	“	2685
“	“	----	----	----	----	----	----	7 00	“	“	“	----	----	----	----	“	“	2686
“	“	----	----	----	----	----	----	6 00	“	“	“	----	----	----	----	“	“	2687
“	“	----	----	----	----	----	----	5 00	“	“	“	----	----	--	----	“	“	2688
“	----	----	----	----	----	----	----	----	“	“	“	----	----	----	----	“	“	2689
“	yes	no	cont.	370	6	yes	yes	----	yes	“	“	----	----	----	----	“	no	2690
“	no	----	----	----	----	----	----	6 50	no	“	“	----	----	----	----	“	“	2691
“	“	----	----	----	----	----	----	4 00	“	“	“	----	----	----	----	“	“	2692
“	----	----	----	----	----	----	----	----	yes	“	“	----	----	----	----	“	yes	2693
“	yes	yes	----	----	----	----	yes	----	“	“	“	----	----	----	----	“	no	2694
“	----	----	----	----	----	----	----	----	no	“	“	----	----	----	----	“	“	2695
“	yes	no	cont.	565	6	yes	yes	----	yes	“	“	----	----	----	----	“	“	2696
“	----	----	----	----	----	----	----	----	no	“	“	----	----	----	----	“	yes	2697
“	----	----	----	----	----	----	----	----	“	“	“	----	----	----	----	“	“	2698
“	no	----	----	----	----	----	----	4 50	“	“	“	----	----	----	----	“	“	2699
“	----	----	----	----	----	----	----	----	“	“	“	----	----	----	----	“	“	2700

Book No. 55. **Table No. 1.**—CONTINUED.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
2701	Jonesville	29	Am.	----	m	2	1	Painter	day	10	no	$1 50	25	Lack of work	$432	$25
2702	"	29	"	----	"	2	--	"	pc.	10	"	1 00	20	" "	293	none
2703	"	46	"	----	s	--	--	"	day	10	"	2 00	40	" "	546	200
2704	Coldwater	41	"	----	m	2	4	"	"	10	"	1 50	75	" "	357	none
2705	"	23	"	----	s	1	3	"	"	10	"	1 00	90	" "	223	"
2706	"	33	"	----	"	--	--	"	pc.	10	yes	1 75	60	" "	443	150
2707	"	17	"	----	"	--	--	"	wk.	10	no	50	80	" "	117	none
2708	"	55	"	----	m	2	1	"	day	10	"	2 00	5	Sickness	616	"
2709	"	38	"	----	"	2	1	"	"	10	yes	1 00	12	Lack of work	301	"
2710	"	28	"	----	w	1	1	"	"	10	"	1 25	90	" "	279	"
2711	"	24	"	----	m	2	--	"	"	10	no	1 00	120	" "	193	"
2712	"	24	"	----	"	2	--	"	"	10	yes	1 50	.90	" "	335	"
2713	Owosso	32	Can	10	s	--	--	"	"	10	----	2 00	13	----	600	100
2714	"	53	Am.	----	m	2	1	"	pc.	10	no	1 33	100	Lack of work	283	none
2715	"	37	"	----	"	2	--	"	"	10	----	1 50	150	" "	245	"
2716	"	25	"	----	s	--	--	"	"	10	----	1 00	100	" "	218	"
2717	"	29	"	----	"	--	--	"	day	10	no	2 00	none	----	626	"
2718	"	22	"	----	"	--	--	"	"	10	"	1 50	200	Sickness	170	"
2719	"	23	"	----	"	--	--	"	"	10	"	1 50	36	Lack of work	415	"
2720	Wayne	17	"	----	"	--	--	"	"	10	"	75	30	" "	212	"
2721	"	25	Fr.	4	"	--	--	"	"	10	yes	1 25	30	" "	354	"
2722	"	24	Am.	----	m	2	1	"	pc.	10	no	1 50	30	" "	425	"
2723	"	27	Can.	10	s	--	--	"	"	10	yes	1 25	10	" "	379	"
2724	"	39	Am.	----	m	2	1	"	"	10	"	2 00	40	" "	546	"
2725	"	21	"	----	s	--	--	"	"	10	"	1 25	60	" "	316	"
2726	"	29	"	----	m	2	2	"	"	10	no	1 50	10	" "	455	"
2727	"	43	"	----	w	1	1	"	"	10	"	2 00	90	" "	446	"
2728	"	20	"	----	s	--	--	"	"	10	yes	1 50	30	" "	425	50
2729	"	21	"	----	m	2	1	"	"	10	"	1 50	30	" "	425	none
2730	"	24	Ger.	10	"	2	--	"	"	10	"	2 00	30	" "	566	100
2731	"	26	Am.	----	"	2	--	"	"	10	"	1 25	60	" "	316	none
2732	White Pigeon	22	"	----	s	--	--	"	day	10	no	1 00	210	" "	103	"
2733	" "	22	"	----	"	--	--	"	"	10	"	1 00	64	" " *	249	"
2734	" "	24	----	----	m	2	--	"	"	10	"	1 00	139	" " *	174	"
2735	" "	18	Am.	----	s	--	--	"	"	10	"	75	25	" "	216	"
2736	" "	32	"	----	m	2	2	"	"	10	"	2 00	38	Sickness	550	"
2737	" "	55	"	----	"	3	1	"	"	10	"	1 50	70	"	365	"
2738	Battle Creek	24	"	----	s	--	--	"	"	10	yes	1 10	18	Laid off	340	"
2739	" "	25	"	----	"	--	--	"	"	10	"	1 21	25	"	380	"
2740	" "	23	"	----	"	--	--	"	"	10	"	1 35	38	"	425	95
2741	" "	22	"	----	"	--	--	"	"	10	"	1 38	25	"	433	75
2742	" "	28	"	----	m	2	2	"	"	10	"	1 37	20	"	431	none
2743	" "	25	"	----	s	--	--	"	"	10	"	1 18	18	"	370	50
2744	" "	17	"	----	"	--	--	"	"	10	"	88	12	Lack of work	265	15
2745	Traverse City	18	"	----	"	--	--	"	"	10	----	1 00	none	----	313	----
2746	" "	35	Can.	16	"	--	--	"	"	10	no	2 00	18	Vacation	590	150
2747	" "	24	Am.	----	"	--	--	"	"	10	----	1 50	none	----	470	none
2748	" "	35	"	----	"	--	--	"	"	10	----	2 25	20	----	659	"
2749	Three Rivers	30	"	----	m	3	1	"	hr.	10	yes	1 50	150	Lack of work	245	"
2750	" "	17	"	----	s	--	--	"	day	10	no	75	100	" "	160	"

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.	no							$6 00	yes	no	None					yes	yes	2701
“	“							5 00	“	“	“					“	“	2702
“	yes	no	cont.			yes	yes		no	“	“					“	“	2703
wk.	no							8 33	yes	“	“					“	“	2704
“	“							5 00			“					“	“	2705
“	yes	yes					yes		yes	no	“					“	“	2706
“											“					“	no	2707
“	yes	no	mort.	$150	7	yes	yes		yes	no	“					“	“	2708
“	no							6 00	no	“	“					“	yes	2709
“	“							6 50			“					“	no	2710
“	“							6 00	no	no	Printers' Union	yes	yes	yes	yes	“	yes	2711
“	“							6 00	yes	“	None					“	“	2712
“	yes	yes					no		no	“	“					“	“	2713
“	no							7 00			“					“	“	2714
“	yes	no	cont.		7	yes	yes				“					“	“	2715
“											“					“	“	2716
“	yes	yes					yes		yes	yes	“					“	“	2717
“	--								no	no	“					“	“	2718
“									“	“	“					“	“	2719
s-mo											“					no	“	2720
“											“					yes	“	2721
“	no							5 00			“					“	“	2722
“											“					“	“	2723
“	no							5 00			“					“	“	2724
“											“					“	“	2725
“	no							4 50			“					“	“	2726
“	“							5 00			“					“	“	2727
“											“					“	“	2728
“	no							5 00			“					“	“	2729
“	“							6 00			“					“	“	2730
“	“							5 00			“					“	“	2731
“									no		“					“	“	2732
“									“		“					“	“	2733
“	no							5 00	yes		“					“	“	2734
“									no		“					“	“	2735
“	no							6 00	yes		“					“	“	2736
“	“							7 50	“		“					“	“	2737
wk.									“	no	“					“	no	2738
“									“	“	“					“	“	2739
“											“					“	“	2740
“											“					“	“	2741
“	yes	no	cont.	400	6	yes	yes		yes	no	“					“	“	2742
“	no							7 00	no	“	“					“	“	2743
“									“	“	“					yes	yes	2744
“											“							2745
“											“					no	yes	2746
“											“					yes	“	2747
“	yes	no							yes		“							2748
“	no							5 00	“	no	“					yes	yes	2749
“											“					“	“	2750

Book No. 56. **Table No. 1.—CONTINUED.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
2751	Three Rivers	29	Am.	----	m	2	2	Painter ----	day	10	no	$0 91	40	Lack of work	$248	------
2752	" "	42	"	----	"	2	1	" ----	"	10	"	1 60	40	" "	437	$35
2753	" "	40	"	----	"	2	5	" ----	"	10	"	1 04	35	" " *	300	18
2754	" "	28	"	----	"	3	1	" ----	"	10	yes	85	78	" "	200	none
2755	Manistee ---	39	Eng.	19	"	2	2	" ----	pc.	10	no	2 50	104	" "	522	"
2756	" ---	34	Am.	----	"	2	4	" ----	"	10	"	2 50	20	Sickness ------	732	"
2757	" ---	17	Ger.	6	s	--	--	" ----	day	10	"	75	100	Lack of work	160	"
2758	" ---	18	Am.	----	"	--	--	" ----	"	10	"	1 50	120	" "	290	"
2759	Linden -----	21	"	----	"	--	--	" ----	pc.	10	"	1 25	150	" "	204	"
2760	" -----	45	Ger.	26	m	2	3	" ----	"	10	"	1 75	125	" "	329	"
2761	" -----	20	Am.	----	s	--	--	" ----	day	10	"	1 00	150	" "	163	"
2762	" -----	23	"	----	"		.	" ----	pc.	10	"	1 00	150	" "	163	"
2763	Mt. Clemens	22	Ger.	----	"	--	--	" ----	day	10	"	1 12	90	" "	250	"
2764	"	24	"	--	m	2	1	" ----	"	10	"	1 50	22	Holidays* ----	437	"
2765	"	32	"	29	"	2	2	" ----	"	10	"	1 67	42	Lack of work	446	------
2766	Monroe -----	52	Am.	----	"	2	--	" ----	pc.	10	"	1 75	30	" "	495	150
2767	" -----	20	Ger.	----	s		--	" ----	day	10	"	1 25	100	------	266	none
2768	" -----	44	Am.	----	m	2	6	" ----	"	10	"	2 50	60	Lack of work	633	------
2769	" -----	27	"	----	"	2	--	" ----	"	10	"	1 00	none	------	313	------
2770	Benton H'b'r	21	"	----	s	--	--	" ----	wk.	10	"	1 25	"	------	391	100
2771	" "	23	Ger.	----	"	--	--	" ----	day	10	"	1 75	78	Sickness -----	411	100
2772	Allegan ----	20	"	----	"	--	--	" ----	"	10	yes	2 00	none	------	626	300
2773	" ----	38	Am.	----	"	--	--	" ----	"	10	no	1 30	60	Lack of work†	368	none
2774	Plymouth --	23	"	----	m	2	--	" ----	"	10	"	1 00	none	------	313	"
2775	Rochester --	22	"	----	s	--	--	" ----	"	10	"	1 00	"	------	313	"
2776	Escanaba --	25	Fr.	----	"	--	--	" ----	wk.	10	yes	2 50	5	Lack of work	770	"
2777	Pontiac ----	19	Am.	----	"	--	--	" ----	pc.	10	"	75	104	" "	157	"
2778	Bay City ----	17	"	----	"	--		" ----	day	10	no	1 25	15	Sickness -----	373	"
2779	Saginaw ---	42	"	----	m	2	3	" ----	"	10	yes	1 00	none	------	313	"
2780	Ionia -------	38	"	----	"	2	1	" ----	"	10	no	2 75	10	Sickness -----	833	200
2781	Jackson ----	18	"	----	s	--	--	" ----	"	10	yes	1 35	60	Lack of work	342	none
2782	Flint	36	Can.	6	m	2	6	Wheelman	pc.	10	"	1 50	30	" "	425	"
2783	" -------	44	"	3	"	2	7	"	"	10	"	1 50	20	" "	440	"
2784	" -------	20	Am.	----	s	--	--	"	"	10	"	1 50	30	" "	425	70
2785	" -------	27	"	----	"	--	--	"	"	10	"	1 25	30	" "	354	none
2786	" -------	35	Can.	18	m	2	3	"	"	10	"	1 50	30	" "	425	"
2787	" -------	18	Am.	----	s		--	"	"	10	"	1 25	30	" "	354	40
2788	" -------	34	Can.	15	m	2	2	"	"	10	no	1 12	100	" "	240	none
2789	" -------	18	Am.	----	s	--	--	"	"	10	yes	1 50	30	" "	425	"
2790	" -------	21	"	----	m	2	--	"	"	10	"	1 25	30	" "	354	100
2791	" -------	30	"	----	"	2	--	"	"	10	"	1 50	5	Vacation -----	462	none
2792	" -------	19	Ger.	12	s	--	--	"	"	10	"	80	50	Lack of work*	210	"
2793	" -------	16	Can.	3	"	--	--	"	"	10	"	50	60	" "	127	"
2794	" -------	17	"	15	"	--	--	"	"	10	"	60	60	" " *	152	"
2795	" -------	40	"	16	m	2	3	"	"	10	"	1 25	20	" "	366	"
2796	" -------	18	Am.	----	s	--	--	"	"	10	"	1 25	60	" "	316	"
2797	" -------	19	"	----	"	--	--	"	"	10	----	1 00	40	" "	273	"
2798	Kalamazoo.	25	"	----	"	--	--	"	"	10	----	1 50	30	" "	425	"
2799	"	35	Irish	16	m	2	2	"	"	10	no	1 50	none	------	470	50
2800	"	35	Hol.	22	"	2	4	"	"	10	----	1 50	30	Lack of work	425	none

* And sickness.
† And vacation.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	no							$5 00	no	no	None					yes	no	2751
"	yes	yes					yes		"	"	"					"	yes	2752
"	"	no	mort.	$125	7	yes	"		"		"					"	"	2753
"	no							5 00	yes		"					no	"	2754
"	"							12 00	no		"					yes	"	2755
"	"								yes	no	"					"	"	2756
"											"					"	"	2757
"											"					"	"	2758
"											"							2759
"	yes	no	mort.	150	7	yes	yes				"					yes	no	2760
"											"					"	yes	2761
"											"					"	"	2762
"									no	no	*	no	yes	no	no	"	"	2763
"	no							7 00			*	"	"	"	"	"	"	2764
"	"							5 00	yes		*	"	"	"	"	no	"	2765
"	yes	yes					yes		"	no	None					yes	"	2766
"									no		"					"	"	2767
"	no							10 00	yes	no	"					"	"	2768
"	yes	yes					no		"	"	"						"	2769
"											"					yes	no	2770
"		"									"					"	yes	2771
"									yes	no	"					"	"	2772
"									"		"					"	"	2773
"	no							3 00	..	yes	"					"	"	2774
"									yes	no	"					"	"	2775
"											"							2776
"									no	no	"					yes	yes	2777
"									"	"	"					"	"	2778
s-mo.	no							5 00			"					"	no	2779
wk.	yes	no	mort.	300	6	yes	yes		yes	yes	"					"	yes	2780
"									no		"					"	"	2781
s-mo.	no							5 00	yes	no	"					"	"	2782
"	"							7 00	"	"	"					"	"	2783
"									"	yes	"					"	"	2784
"									"	no	"					"	"	2785
"	no							6 00	"	"	"					"	"	2786
"									"	"	"					"	"	2787
"	no							6 00	"		"					"	"	2788
"									no	no	"					"	"	2789
"	no							6 00	yes	"	"					"	"	2790
"	"								"		"					"	"	2791
"									no	no	"					"	"	2792
"									"	"	"					no	no	2793
"									"	"	"					yes	yes	2794
"	no							6 00	yes	"	"					"	"	2795
"									"	"	"					"	"	2796
wk.	no							6 00	no	"	"					"	"	2797
"											Wheelm'k's Union					"	"	2798
"	yes	yes					yes		yes		"					"	"	2799
"	no							7 00			"					"	"	2800

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* Donaldson Bros. Employés' Sick and Accident Benefit Association.

Book No. 57. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single.	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
2801	Kalamazoo.	40	Am.	----	m	2	2	Wheelman	pc.	10	----	$1 40	30	Lack of work	$396	$60
2802	"	30	Ger.	----	"	2	1	"	"	10	----	1 50	30	" "	425	50
2803	"	35	Am.	----	"	2	4	"	"	10	----	1 50	30	" "	425	none
2804	"	25	"	----	"	2	1	"	"	10	----	1 65	30	" "	467	10
2805	"	30	"	----	"	2	--	"	"	10	----	2 00	10	" "	606	150
2806	"	32	"	----	"	2	--	"	"	10	----	2 00	35	" "	556	none
2807	"	32	Ger.	25	"	2	1	"	"	10	no	2 00	30	" "	566	"
2808	"	28	Am.	----	"	2	--	"	"	10	----	1 50	10	" "	455	50
2809	"	35	"	----	"	2	2	"	day	10	----	2 25	10	" "	682	300
2810	"	30	"	----	"	2	--	"	"	10	----	1 60	30	" "	453	50
2811	"	45	"	----	s	--	--	"	"	10	----	2 00	90	" "	446	none
2812	Charlotte	35	"	----	"	--	--	"	pc.	10	yes	35	100	" "	75	"
2813	"	17	"	----	"	--	--	"	wk.	10	no	50	100	" "	106	"
2814	"	18	"	----	"	--	--	"	pc.	10	"	35	100	" "	75	"
2815	"	39	"	----	m	2	1	"	"	10	"	1 00	60	" "	253	"
2816	Jackson	27	"	----	s	--	--	"	wk.	10	yes	1 25	50	" "	330	"
2817	"	16	"	----	"	--	--	"	day	10	"	75	60	" " *	190	"
2818	"	48	Swiss	47	m	5	6	"	wk.	10	no	2 50	none	----------	783	------
2819	"	17	Ger.	----	s	--	--	"	day	10	"	75	"	----------	235	none
2820	Ionia	28	Am.	----	"	--	--	"	pc.	10	"	2 00	60	Lack of work	506	75
2821	"	44	"	----	m	2	3	"	"	10	"	2 00	90	" "	446	none
2822	"	34	"	----	"	2	5	"	"	10	"	2 00	60	" "	506	"
2823	"	32	"	----	"	2	2	"	day	10	"	1 65	26	Sickness	474	------
2824	Detroit	21	"	----	s	--	--	"	pc.	10	"	1 25	90	Lack of work	279	none
2825	"	20	"	----	"	--	--	"	"	10	"	1 00	60	" "	253	"
2826	"	18	Ger.	12	"	--	--	"	day	10	yes	1 25	none	----------	425	225
2827	"	30	Can.	18	m	2	--	"	"	10	"	2 00	"	----------	700	120
2828	Battle Creek	28	Ger.	----	"	2	1	"	"	10	"	1 71	14	Lack of work	535	none
2829	" "	30	Am.	----	"	2	3	"	"	10	"	1 68	14	" "	525	75
2830	" "	32	"	----	"	2	2	"	"	10	"	1 63	25	" " *	510	50
2831	Lansing	44	Ger.	14	"	4	3	"	"	10	no	2 00	25	" "	576	none
2832	"	25	Am	----	s	--	--	"	"	10	"	1 80	50	" "	473	50
2833	Marshall	71	"	----	m	6	--	"	pc.	10	"	1 50	15	" "	447	150
2834	"	19	"	----	s	--	--	"	wk.	10	"	1 00	30	" "	283	none
2835	Bay City	19	"	----	"	--	--	"	day	10	yes	1 00	50	" "	263	"
2836	"	43	Eng.	23	m	2	2	"	"	10	"	2 00	10	Sickness	606	100
2837	G'd Rapids.	33	Am	----	"	2	4	"	"	10	"	1 50	none	----------	528	none
2838	Kalamazoo.	40	"	----	s	--	--	Springmaker	pc.	10	----	4 00	30	Lack of work	1,012	550
2839	"	50	"	----	m	2	--	"	"	10	----	3 75	60	" "	949	200
2840	"	39	"	----	s	--	--	"	"	10	----	3 75	35	" "	1,043	200
2841	"	42	"	----	m	3	4	"	"	10	----	3 50	30	" "	991	400
2842	"	25	"	----	s	--	--	"	"	10	----	3 25	60	" "	822	200
2843	"	24	"	----	"	--	--	"	day	10	----	1 25	10	" "	379	100
2844	"	29	"	----	"	--	--	"	"	10	----	1 25	30	" "	316	none
2845	"	28	"	----	"	--	--	"	"	10	----	1 50	30	" "	380	"
2846	"	28	"	----	"	--	--	"	"	10	----	1 50	90	" "	335	"
2847	"	32	"	----	"	--	--	"	"	10	----	1 50	90	" "	335	"
2848	"	28	"	----	"	--	--	"	"	10	----	1 50	200	" "	170	"
2849	"	21	"	----	"	--	--	"	"	10	----	1 50	90	" "	335	"
2850	"	32	"	----	m	2	3	"	"	10	----	1 50	100	" "	320	"

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* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	yes	yes	----	----	----	----	yes	----	----	----	Wheelm'k's Union	----	----	----	----	yes	yes	2801
"	no	----	----	----	----	----	----	$7 50	yes	----	" "	----	----	----	----	no	no	2802
"	"	----	----	----	----	----	----	7 00	"	----	" "	----	----	----	----	yes	yes	2803
"	"	----	----	----	----	----	----	8 00	----	----	" "	----	----	----	----	"	"	2804
"	yes	yes	----	----	----	----	yes	----	----	----	" "	----	----	----	----	"	"	2805
"	no	----	----	----	----	----	----	9 00	----	----	" "	no	yes	----	----	"	"	2806
"	"	----	----	----	----	----	----	7 00	----	----	" "	"	"	no	----	no	no	2807
"	yes	yes	----	----	----	----	no	----	yes	----	" "	----	----	----	----	yes	yes	2808
"	"	"	----	----	----	----	yes	----	----	----	" "	----	----	----	----	"	"	2809
"	no	----	----	----	----	----	----	6 50	----	----	" "	----	----	----	----	"	"	2810
"	----	----	----	----	----	----	----	----	----	----	" "	----	----	----	----	"	"	2811
"	----	----	----	----	----	----	----	----	no	no	None	----	----	----	----	"	"	2812
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	2813
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	----	no	2814
"	no	----	----	----	----	----	----	----	"	yes	"	----	----	----	----	yes	"	2815
s-mo.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	yes	2816
wk.	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	2817
"	no	----	----	----	----	----	----	9 00	yes	yes	"	----	----	----	----	"	"	2818
"	----	----	----	----	----	----	----	----	"	no	"	----	----	----	----	"	"	2819
s-mo.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	2820
"	yes	no	cont.	$500	7	yes	yes	----	yes	no	"	----	----	----	----	"	"	2821
"	no	----	----	----	----	----	----	8 00	"	"	"	----	----	----	----	"	"	2822
"	"	----	----	----	----	----	----	8 00	"	yes	"	----	----	----	----	"	"	2823
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	2824
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	2825
wk.	yes	yes	----	----	----	----	yes	----	----	----	"	----	----	----	----	"	----	2826
"	no	----	----	----	----	----	----	8 00	----	----	Brass Workers U.	no	yes	yes	----	"	----	2827
"	"	----	----	----	----	----	----	7 00	----	----	None	----	----	----	----	"	yes	2828
"	"	----	----	----	----	----	----	8 00	yes	no	"	----	----	----	----	"	"	2829
"	yes	no	mort.	200	7	yes	yes	----	"	"	"	----	----	----	----	"	"	2830
s-mo.	"	yes	----	----	----	----	"	----	"	"	"	----	----	----	----	no	no	2831
"	"	"	----	----	----	----	"	----	----	----	"	----	----	----	----	yes	yes	2832
wk.	"	"	----	----	----	----	"	----	no	no	"	----	----	----	----	"	"	2833
s-mo.	"	"	----	----	----	----	"	----	"	"	"	----	----	----	----	"	no	2834
wk.	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	yes	2835
"	yes	yes	----	----	----	----	yes	----	yes	"	"	----	----	----	----	"	"	2836
s-mo.	no	----	----	----	----	----	----	10 00	"	"	"	----	----	----	----	"	"	2837
wk.	yes	yes	----	----	----	----	yes	----	"	----	"	----	----	----	----	"	"	2838
"	"	"	----	----	----	----	"	----	"	----	"	----	----	----	----	"	"	2839
"	----	----	----	----	----	----	----	----	"	----	"	----	----	----	----	"	"	2840
"	yes	yes	----	----	----	----	yes	----	"	----	"	----	----	----	----	"	"	2841
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	2842
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	2843
"	----	----	----	----	----	----	----	----	yes	----	"	----	----	----	----	"	"	2844
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	2845
"	----	----	----	----	----	----	----	----	yes	----	"	----	----	----	----	"	"	2846
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	2847
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	2848
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	2849
"	no	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	2850

Book No. 58. **Table No. 1.—CONTINUED.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work.	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
2851	Kalamazoo.	19	Hol.	10	s	--	--	Springmaker	day	10	----	$1 25	30	Lack of work	$354	$25
2852	"	40	Am.	---	m	2	2	"	"	10	----	1 50	30	" "	425	125
2853	"	20	"	----	s	--	--	"	"	10	----	1 25	30	" "	354	100
2854	"	19	"	----	"	--	--	"	"	10	----	1 00	100	" "	213	none
2855	"	19	"	----	"		-	"	"	10	---	80	35	" "	222	"
2856	"	39	"	---	m	2	--	"	pc.	10	----	2 00	30	" "	566	150
2857	"	18	"	----	s	--	--	"	day	10	----	75	60	" "	190	none
2858	"	24	"	----	"	--	--	"	pc.	10	----	2 00	90	" "	446	125
2859	"	30	"	----	"	--	--	"	"	10	----	1 75	150	" "	285	none
2860	"	28	"	----	"	--	--	"	"	10	----	1 50	200	" "	170	"
2861	"	25	Hol	20	m	2	3	"	"	---	----	1 75	90	" "	390	"
2862	"	22	Am.	----	s	--	--	"	"	10	----	1 60	150	" "	261	"
2863	"	17	"	----	"	--	--	"	"	10	----	50	70	" "	142	"
2864	"	51	"	----	m	2	3	"	"	10	----	1 75	30	" "	495	125
2865	"	19	"	----	s	--	--	"	"	10	----	1 40	150	" "	228	none
2866	"	28	"	----	"	--	--	"	"	10	----	1 50	30	" "	425	175
2867	"	26	"	----	"	--	--	"	"	10	----	1 75	120	" "	338	none
2868	"	21	"	----	"	--	--	"	"	10	----	1 25	90	" "	278	"
2869	"	39	"	----	m	2	2	"	"	10	----	2 25	100	" "	479	50
2870	"	25	"	----	s	--	--	"	"	10	----	1 50	30	" "	425	none
2871	"	26	"	----	"	--	--	"	"	10	----	1 80	150	" "	293	"
2872	"	21	"	----	"	--	--	"	"	10	----	2 25	30	" "	637	325
2873	"	18	"	----	"	-	-	"	day	10	----	75	30	" "	212	none
2874	"	29	"	----	"	--	--	"	"	10	----	1 75	90	" "	390	"
2875	"	20	"	----	"	--	--	"	"	10	----	1 50	90	" "	335	"
2876	"	26	"	----	"	--	--	"	"	10	----	1 45	95	" "	316	"
2877	"	23	"	---	m	2	--	"	"	10	----	1 75	90	" "	390	"
2878	"	23	"	----	s	--	--	"	"	10	----	1 60	35	" "	491	"
2879	"	24	"	----	"	--	--	"	"	10	----	1 50	100	" "	420	"
2880	"	32	"	----	"	--	--	"	"	10	----	1 65	120	" "	317	"
2881	"	30	"	----	"	--	--	"	"	10	----	1 75	30	" "	443	"
2882	"	29	Hol.	20	m	2	4	"	"	10	----	2 00	60	" "	506	225
2883	"	39	Am.	----	s	--	--	"	"	10	----	1 75	30	" "	443	none
2884	"	45	"	----	m	2	1	"	"	10	----	1 75	30	" "	495	200
2885	"	32	"	----	s	--	--	"	pc.	10	----	1 75	60	" "	443	none
2886	"	27	"	----	"	--	--	"	"	10	----	1 50	10	" "	455	"
2887	"	28	"	---	m	2	1	"	"	10	----	2 00	60	" "	506	100
2888	Jackson ----	35	"	----	"	2	--	Spring fitter	"	10	yes	1 50	30	Sickness -----	425	none
2889	" ----	37	"	----	"	2	--	"	"	10	"	2 00	105	" -----	416	"
2890	" ----	39	"	----	w	1	2	"	"	10	"	2 00	12	Lack of work	602	175
2891	" ----	31	"	----	m	3	--	"	"	10	"	2 50	12	" "	753	150
2892	" ----	28	"	----	"	4	--	"	"	10	"	2 50	12	" "	753	185
2893	" ----	24	"	----	"	2	--	"	"	10	"	2 00	18	" "	590	100
2894	" ----	37	"	----	"	3	--	"	"	10	"	2 00	40	Sickness -----	546	none
2895	Pontiac ----	52	"	----	"	2	3	"	wk.	10	no	1 65	none	----------------	516	"
2896	Northville --	23	"		"	2	1	Band sawyer	day	10	yes	1 25	18	Lack of work	369	30
2897	Coldwater --	66	"	----	"	2	2	"	"	10	"	1 50	30	" " *	425	250
2898	G'd Rapids.	24	Ger.	10	"	2	--	Frame worker	pc.	----	"	3 00	6	Pleasure -----	1,014	175
2899	"	36	Can.	11	"	2	4	"	day	10	no	1 50	78	Lack of work	353	none
2900	"	26	Ger.	10	"	2	1	"	wk.	10	yes	2 16	234	" "	255	"

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* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.											None					no	no	2851
"	yes	no	cont.	$150	7		yes				"					yes	yes	2852
"											"					"	no	2853
"											"					"	yes	2854
"											"					"	"	2855
"	yes	no	cont.	225	7	yes	yes				"					"	"	2856
"											"					"	"	2857
"											"					"	"	2858
"											"					"	"	2859
"									yes		"					"	"	2860
"	yes	yes					yes				"					"	"	2861
"											"					"	"	2862
"											"					"	"	2863
"	yes	yes					no		no		"					"	"	2864
"											"					"	"	2865
"											"					"	"	2866
"											"					"	"	2867
"											"					"	"	2868
"	yes	yes					yes				"					"	"	2869
"									ye		"					"	"	2870
"											"					"	"	2871
"									yes		"					"	"	2872
"											"					"	"	2873
"											"					"	"	2874
"									no		"					"	"	2875
"											"					"	"	2876
"	yes	yes					yes				"					"	"	2877
"											"					"	"	2878
"									yes		"					"	"	2879
"									no		"					"	"	2880
"											"					"	"	2881
"	yes	yes					yes		yes		"					no	no	2882
"									no		"					yes	yes	2883
"	no							$7 00			"					"	"	2884
"											"					"	"	2885
"									no		"					"	"	2886
"	yes	yes					yes				"					"	"	2887
"	no							8 00	yes	no	"					"	no	2888
"	yes	no	cont.	300	5	yes	yes				"					"	yes	2889
"	no							6 50	yes	no	"					"	"	2890
"	"							6 00	"	"	"					"	"	2891
"	yes	no	cont.	550	7	yes	yes		"	"	"					"	no	2892
"	"	"	"	850	7	"	"		"	"	"					"	yes	2893
"	no							10 00	"	"	"					"	"	2894
"	yes	no	mort.	250	8	yes	yes		"	"	"					"	no	2895
"	no							5 00	"	"	"					"	yes	2896
"	yes	yes					yes		no	"	"					"	no	2897
s-mo.	no							5 00	"	"	B. of B. M.	no	no	no	yes	"	yes	2898
"	"							6 00	yes	"	"	"	"	"	"	"	"	2899
"	"							7 00	no	"	None					"	"	2900

Book No. 59. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
2901	G'd Rapids	50	Ger.	30	m	2	4	Frame worker	day	10	yes	$1 75	104	Lack of work	$392	none
2902	"	29	Am.	----	"	2	1	"	"	10	"	1 35	78	" "	371	"
2903	"	26	"	----	"	2	1	"	"	10	"	1 75	none	----------------	616	"
2904	"	26	"	----	"	2	1	"	"	10	"	1 75	130	Lack of work	389	"
2905	"	27	"	----	s	--	--	"	"	10	"	1 50	78	" "	411	"
2906	"	38	"	----	m	2	1	"	"	10	"	1 75	52	Pleasure ----	525	"
2907	"	27	"	---	"	2	--	"	"	10	"	1 75	52	Lack of work	525	"
2908	"	24	Ger.	14	s	--	--	"	"	10	"	1 35	182	" "	230	"
2909	Detroit	25	Am	----	m	2	--	"	"	10	no	1 50	80	" "	350	$50
2910	"	29	Irish	5	s	--	--	"	"	10	"	1 75	156	" "	275	none
2911	"	24	Am	---	"	--	--	"	"	10	"	2 00	100	" "	426	"
2912	"	30	Irish	7	"	--	--	"	"	10	"	2 00	78	" "	470	100
2913	"	24	Am.	----	m	2	-	"	"	10	"	1 50	100	" "	320	none
2914	"	54	Can.	----	"	4	2	"	"	10	"	2 50	90	Sickness -----	557	"
2915	Bay City	31	Am.	----	"	2	3	"	"	10	"	1 25	100	Lack of work	266	"
2916	Jackson	27	Ger.	15	"	2	--	"	"	10	"	2 00	30	" "	566	"
2917	Lansing	19	Am.	----	s	--	-	Setting up	"	10	"	1 20	10	Sickness*----	364	25
2918	"	19	"	----	"	--	--	"	"	10	"	1 00	2	Other business	311	none
2919	"	27	Ger.	----	m	2	2	"	"	10	"	1 00	30	Lack of work	283	"
2920	"	37	"	----	"	2	1	"	"	10	"	1 50	25	" "	432	25
2921	Detroit	32	Am.	----	"	2	2	"	"	10	"	1 75	none	----------------	548	none
2922	"	29	"	----	s	--	--	"	"	10	"	2 00	30	Lack of work	566	"
2923	Jackson	19	"	----	"	--	--	"	"	10	yes	1 50	40	Sickness ----	410	"
2924	"	21	"	----	"	--	--	"	"	10	"	1 50	52	Lack of work	392	"
2925	"	37	"	----	m	2	3	"	"	10	no	1 50	12	Sickness -----	452	100
2926	Marshall	41	"	----	"	2	4	"	"	10	yes	1 25	6	Lack of work	385	none
2927	"	43	"	----	"	2	2	"	"	10	"	1 25	30	" "	354	"
2928	Wayne	25	"	----	"	2	1	"	"	10	"	1 25	60	" "	316	"
2929	"	24	"	----	"	3	--	"	"	10	no	1 25	30	Sickness*----	353	"
2930	Jonesville	39	"	----	"	2	--	"	"	10	"	1 50	90	Lack of work	335	50
2931	Three Rivers	31	"	----	"	2	2	"	"	10	"	1 50	52	" "	392	100
2932	Jackson	29	"	----	"	2	--	Finisher ----	pc.	10	"	1 75	200	" "	198	none
2933	"	28	"	----	"	2	2	" ----	"	10	yes	1 50	100	" "	320	25
2934	"	25	Irish	----	s	--	--	" ----	"	10	"	1 50	100	" "	320	60
2935	"	21	"	----	"	--	--	" ----	"	10	no	1 35	100	" "	288	none
2936	"	37	Am.	----	m	2	6	" ----	"	10	"	1 50	100	" "	320	"
2937	"	22	"	----	s	--	--	" ----	"	10	"	1 75	25	" " †	504	100
2938	"	22	"	----	m	2	--	" ----	"	10	yes	1 50	35	" " *	417	none
2939	"	20	Irish	----	s	--	--	" ----	"	10	no	1 50	100	" "	320	"
2940	"	36	"	----	m	2	4	" ----	"	10	"	1 50	100	" " *	320	10
2941	"	37	Am.	----	"	2	--	" ----	day	10	"	1 75	60	" "	443	none
2942	"	23	Pol.	5	s	--	--	" ----	"	10	yes	1 38	40	" " †	375	10
2943	"	19	Am.	----	"	-	--	" ----	"	10	"	1 00	13	" "	300	none
2944	"	25	Pol.	7	m	2	--	" ----	"	10	"	1 25	20	Pleasure -----	366	125
2945	"	26	"	5	s	--	--	" ----	"	10	"	1 25	48	Sickness -----	331	100
2946	"	25	"	4	"	--	--	" ----	"	10	"	1 25	48	Lack of work	331	50
2947	Detroit	35	Am.	----	"	--	--	" ----	pc.	10	no	2 00	60	" "	508	none
2948	"	22	"	----	"	--	--	" ----	"	10	"	1 50	60	Sickness -----	380	"
2949	"	28	"	----	m	2	3	" ----	"	10	"	1 75	60	Lack of work	443	100
2950	"	23	"	----	s	--	--	" ----	"	10	"	1 50	90	" "	335	none

* And pleasure.
† And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	yes	no	mort.	$700	6	yes	yes		yes	no	B. of B. M.	no	no	no	yes	yes	yes	2901
s-mo.	no							$7 00	no	"	None					"	"	2902
"	"							6 00	"	"	B. of B. M.	no	no	no	yes	"	"	2903
"	"							4 00	yes	"	"	"	"	"	"	"	"	2904
"									no	"	None					"	"	2905
"	no							6 00	yes	"	B. of B. M.	no	no	no	yes	"	"	2906
"	"								no	"	"	"	"	"	"	"	"	2907
"									"	"	None					"	"	2908
wk.	no							8 00			"					no		2909
"											"					"		2910
"											"					yes	yes	2911
"											"					no		2912
"	no							7 00			"					yes		2913
"	"							15 00			"					no		2914
"	yes	no	cont.	350	7	yes	no		yes	no	"					yes	yes	2915
"	no							6 00	"		"					"	"	2916
"									no	no	"					"	"	2917
"									"	"	"					"	"	2918
"	no							6 00	yes	"	"					"	"	2919
"	yes	yes					yes		no	"	"					"	"	2920
s-mo.	no							10 00	yes	"	"					"	"	2921
wk.									"	yes	"					"	"	2922
s-mo.											"					"	"	2923
"											"					"	"	2924
wk.	yes	yes					yes		no	no	"					"	"	2925
"	no										"					"	"	2926
"	"								yes		"					"	"	2927
s-mo.	yes										"					"	"	2928
"	no							5 00			"					"	"	2929
"	yes	yes					yes		yes	no	"					"	"	2930
wk.	"	no	cont.	150	7	no	"		"	yes	"					"	"	2931
"	no							6 00	no	no	"					"	"	2932
"	"							6 00	"	"	"					no	no	2933
"									"	"	"					"	"	2934
"									"	"	"					"	"	2935
"	no							5 00	"	"	"					"	yes	2936
"									yes	"	"					"	no	2937
"	no							8 00	no	"	"					yes	"	2938
"									"	"	"					no	yes	2939
"	yes	no	mort.	450	7	yes	yes		yes	"	"					yes	"	2940
s-mo	"	"	cont.	1,000	6	"	"		no	"	"					"	"	2941
wk.											"					no	"	2942
"											"					"	no	2943
"	no							5 00	no	no	"					yes	yes	2944
"									"	"	"					"	"	2945
"									"		"					"	"	2946
s-mo.									"	no	"					"	"	2947
"									"	"	"					"	"	2948
"	no							8 00	yes	"	"					"	"	2949
"									no	"	"					"	"	2950

Book No. 60. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
2951	Detroit	22	Am.	----	s	--	--	Finisher	pc.	10	no	$1 50	90	Lack of work	$335	none
2952	"	30	"	----	m	2	2	"	"	10	"	2 00	30	" "	566	$100
2953	"	30	"	----	"	2	2	"	"	10	"	2 50	30	" "	708	100
2954	"	35	"	----	"	2	2	"	"	10	"	2 50	30	" "	708	150
2955	Flint	19	Eng.	6	s	--	--	"	day	10	yes	1 25	60	Vacation	316	none
2956	"	29	Can.	8	m	2	1	"	pc.	10	no	1 75	60	Lack of work	443	100
2957	"	31	"	10	"	2	--	"	day	10	"	2 25	25	" " *	648	200
2958	Coldwater	44	Am.	----	"	2	3	"	pc.	10	yes	1 25	90	" "	279	none
2959	"	19	"	----	s	1	2	"	day	10	"	1 25	90	" "	279	"
2960	G'd Rapids	28	Hol.	25	m	2	3	"	"	10	no	1 50	12	" "	452	"
2961	"	28	Am.	----	"	2	--	"	"	10	"	2 25	156	" "	353	"
2962	Lansing	33	"	----	"	2	--	"	pc.	10	"	1 85	125	" "	254	100
2963	"	20	"	----	s	--	--	"	"	10	"	85	90	" "	190	none
2964	Ovid	35	Can.	16	m	2	5	"	"	10	"	1 50	150	Other work	244	"
2965	"	44	Am.	----	"	2	4	"	"	10	"	1 50	150	" "	244	"
2966	Wayne	41	"	----	"	2	--	"	day	10	yes	1 75	30	Lack of work	495	"
2967	"	30	Can.	4	"	2	--	"	"	10	no	1 35	120	" "	266	"
2968	Kalamazoo	30	Am.	----	"	2	2	"	pc.	10	----	2 00	90	" "	446	"
2969	Lapeer	52	"	----	"	2	--	"	day	10	no	2 50	28	" "	717	"
2970	Ypsilanti	38	"	----	s	--	--	"	"	10	"	1 75	100	" " *	373	75
2971	Kalamazoo	40	"	----	m	2	1	Trimmer	"	10	----	2 00	150	" "	326	50
2972	"	46	Ger.	20	"	2	3	"	"	10	no	2 50	none	----------	783	300
2973	"	22	Fr.	18	s	--	--	"	pc.	10	----	1 50	150	Lack of work	245	none
2974	"	25	Am.	----	"	--	--	"	"	10	no	1 75	150	" "	285	"
2975	"	36	"	----	m	2	1	"	"	10	"	2 25	none	----------	704	210
2976	"	24	"	----	s	--	--	"	"	10	"	2 00	"	----------	626	150
2977	"	18	"	----	"	--	--	"	day	10	"	50	150	Lack of work	82	none
2978	"	19	"	----	"	--	--	"	"	10	"	75	150	" "	122	"
2979	"	22	"	----	"	--	--	"	pc.	10	"	2 00	none	----------	626	200
2980	"	30	"	----	m	2	1	"	"	10	"	1 75	"	----------	548	100
2981	"	20	"	----	s	--	--	"	day	10	"	1 25	"	----------	391	none
2982	"	18	Ger.	10	"	--	--	"	"	10	"	75	150	Lack of work	122	"
2983	"	20	Am.	----	"	--	--	"	"	10	"	1 25	none	----------	391	"
2984	"	22	"	----	"	--	--	"	"	10	"	1 50	150	Lack of work	245	"
2985	"	38	"	----	m	2	1	"	pc.	10	"	2 00	150	" "	326	"
2986	"	18	"	----	s	--	--	"	day	10	"	75	none	----------	235	"
2987	"	17	"	----	"	--	--	"	"	10	----	75	60	Lack of work	190	"
2988	"	16	"	----	"	--	--	"	"	10	----	60	30	" "	170	"
2989	"	22	"	----	"	--	--	"	pc.	10	no	1 85	60	" "	468	"
2990	"	18	"	----	"	--	--	"	day	10	"	75	none	----------	234	"
2991	"	18	"	----	"	--	--	"	"	10	"	1 00	"	----------	313	60
2992	"	19	"	----	"	--	--	"	"	10	"	1 25	"	----------	391	40
2993	"	19	"	----	"	--	--	"	pc.	10	"	1 00	"	----------	313	none
2994	"	30	"	----	"	--	--	"	"	10	"	1 50	60	Lack of work	380	"
2995	"	26	Ger.	----	"	--	--	"	"	10	"	1 75	60	" "	443	10
2996	"	25	Am.	----	"	--	--	"	"	10	"	1 75	30	" "	495	25
2997	"	35	"	----	"	--	--	"	"	10	"	2 25	90	" "	502	10
2998	"	21	Hol.	15	"	--	--	"	"	10	"	2 00	30	" "	566	100
2999	"	20	Am.	----	"	--	--	"	"	10	"	3 00	100	" "	639	none
3000	"	22	"	----	"	--	--	"	day	10	"	2 25	90	" "	502	"

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.									yes	no	None					yes	yes	2951
"	no							$8 00	"	"	"					"	"	2952
"	"							10 00	no	"	"					"	"	2953
"	yes	yes							yes	"	"					"	"	2954
"	no								"	"	"					"	"	2955
wk.	"							6 00			"					"	"	2956
"	yes	no	cont.		7	yes	yes				"					"	no	2957
"	no							6 00	yes	no	"					"	yes	2958
"	yes	yes					yes		no	"	"					"	"	2959
"	no							5 50	"	"	"					"	"	2960
"	yes	no	cont.	$600	8	yes	yes		"	"	"					no	no	2961
s-mo.	no							5 00	"	yes	"					yes	yes	2962
"									"	no	"					"	"	2963
"	yes	no	mort.	125	8	yes	yes		yes	"	"					"	"	2964
"	"	"	"	150	8	"	"		no	"	"					"	no	2965
"	no							6 00	yes	"	"					"	yes	2966
"	"							5 00			"					"	"	2967
wk.	yes	no	cont.	300	7	yes	yes				"					"	"	2968
"	no							8 00			"					"	"	2969
"											"					"	"	2970
"	no								yes		"					"	"	2971
s-mo.	"							8 00			"					"	"	2972
"									no		"					no	no	2973
"									yes		"					yes	yes	2974
"	yes	yes					yes		"		"					"	"	2975
"											"					"	"	2976
"											"					"	"	2977
"											"					"	"	2978
"									yes		"					"	"	2979
"	no							7 00			"					"	"	2980
"									no		"					no	no	2981
"											"					"	"	2982
"									yes		"					yes	yes	2983
"									no		"					"	"	2984
"	no							6 00			"					"	"	2985
"											"					no	"	2986
wk.											"					yes	"	2987
"											"					"	"	2988
"											"					"	"	2989
mo.											"					"	"	2990
"											"					"	"	2991
"											"					"	"	2992
"									no		"					"	"	2993
"									yes		C. & W. M. U.	no	no	no	yes	"	"	2994
"									"		None					"	"	2995
"									"		C. & W. M. U.	no	no	no	yes	"	"	2996
"									"		None					"	"	2997
"									"		"					"	"	2998
									no		"					"	"	2999
mo.											"					"	"	3000

Book No. 61. **Table No. 1.—CONTINUED.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3001	Kalamazoo.	40	Ger.	20	m	2	4	Trimmer	pc.	10	no	$2 00	90	Lack of work	$446	none
3002	"	35	Am.	----	s	--	--	"	"	10	"	3 00	60	" "	506	$100
3003	"	32	"	----	"		--	"	"	10	"	2 00	30	" "	566	50
3004	"	38	"	----	"	--	--	"	"	10	"	2 50	40	" "	682	125
3005	"	25	"	----	"	--	--	"	"	10	"	2 50	30	" "	708	200
3006	"	36	Irish	23	"	--	--	"	"	10	----	2 50	110	" "	508	none
3007	"	40	Am.	----	"	--	--	"	----	10	----	3 00	30	" "	849	325
3008	"	22	"	----	"	--	--	"	pc.	10	no	1 50	60	" "	380	85
3009	"	40	"	----	m	2	1	"	"	10	----	3 50	60	" "	886	100
3010	"	21	"	----	s	--	--	"	day	10	no	1 25	30	" "	354	none
3011	"	30	"	----	m	2	2	"	pc.	10	"	2 50	30	" "	708	200
3012	"	26	"	----	"	2	--	"	"	10	"	2 00	45	" "	536	none
3013	"	24	"	----	s	--	--	"	"	10	----	2 00	20	" "	586	"
3014	"	19	Hol.	10	"	--	--	"	day	10	no	1 00	90	" "	223	"
3015	"	40	Am.	----	m	2	3	"	"	10	"	2 50	none	----------------	783	250
3016	"	28	"	----	"	2	1	"	"	10	----	2 00	50	Lack of work	526	50
3017	"	18	Ger.	6	s	--	--	"	"	10	----	80	140	" "	138	none
3018	"	18	Fr.	15	"	--	--	"	"	10	----	75	130	" "	137	"
3019	"	48	Am.	----	m	2	1	"	"	10	----	2 25	15	" "	670	100
3020	"	30	Hol.	20	s	--	--	"	pc.	10	no	2 00	50	" "	526	100
3021	"	28	Am.	----	"	--	--	"	"	10	"	2 25	40	" "	614	110
3022	"	26	"	----	"	--	--	"	"	10	"	2 00	35	" "	516	25
3023	"	24	"	----	"	--	--	"	"	10	"	2 00	150	" "	326	none
3024	"	23	"	----	"	--	--	"	"	10	"	1 50	150	" "	245	"
3025	"	26	"	----	"	--		"	"	10	"	1 50	80	" "	350	10
3026	"	30	Hol.	23	m	2	2	"	"	10	"	2 25	66	" "	556	12
3027	"	43	Fr.	15	"	2	--	"	day	10	----	2 00	30	" "	586	none
3028	"	19	Am.	----	s	--	--	"	"	10	----	1 50	156	" "	235	50
3029	"	19	"	----	"	--	--	"	"	10	----	1 25	30	" "	354	50
3030	"	28	"	----	m	2	--	"	pc.	10	yes	2 50	20	" "	733	200
3031	"	18	"	----	s	--	--	"	day	10	no	75	20	" "	220	none
3032	"	25	"	----	"	--	--	"	"	10	"	2 00	90	" "	446	5
3033	"	35	"	----	"	--	--	"	pc.	10	"	2 00	160	" "	306	none
3034	"	39	"	----	"	--	--	"	"	10	"	2 00	110	" "	406	10
3035	"	18	"	----	"	--	--	"	day	10	----	60	35	" "	167	none
3036	"	16	"	----	"	--	--	"	"	10	----	50	30	" "	142	"
3037	"	18	"	----	"	--	--	"	"	10	----	75	35	" "	209	"
3038	"	20	"	----	"	--	--	"	"	10	----	1 00	90	" "	223	"
3039	"	24	"	----	"	--	--	"	"	10	----	1 50	30	" "	425	"
3040	"	24	"	----	"	--	--	"	pc.	10	----	2 00	90	" "	336	"
3041	"	43	"	----	m	2		"	day	10	----	1 75	30	" "	495	"
3042	"	30	"	----	s	--	--	"	pc.	10	----	2 00	35	" "	556	100
3043	"	36	Hol.	22	m	2	3	"	"	10	----	2 25	90	" "	502	150
3044	"	28	Am.	----	s	--	--	"	"	10	----	1 75	60	" "	443	none
3045	"	27	"	----	m	2	1	"	"	10	----	2 50	100	" "	783	50
3046	"	20	"	----	s	--	--	"	"	10	no	1 75	150	" "	285	none
3047	"	42	"	----	m	2	--	"	"	10	"	2 00	none	----------------	626	160
3048	"	40	"	----	"	2	1	"	"	10	----	3 50	30	Lack of work	991	210
3049	"	25	"	--	s	-		"	"	10		1 25	60	" "	316	none
3050	"	28	"	----	m	2	--	"	"	10	no	2 00	30	" "	566	100

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
mo.	no								yes		None					no	no	3001
"									"		"					yes	yes	3002
"									no		"					"	"	3003
"									"		"					"	"	3004
"											C. & W. M. U.	no	no	no	yes	"	"	3005
"									yes		"	"	"	"	"	"	"	3006
"									"		None					"	"	3007
"									"		"					"	"	3008
"	yes	yes					yes		no		"					"	"	3009
"											"					"	"	3010
"	yes	yes					yes		yes		"					"	"	3011
"	no							$9 00			C. & W. M. U.	no	no	no	yes	"	"	3012
"									yes		None					"	"	3013
"									"		"					"	"	3014
wk.	yes	yes					yes		"		"					no	no	3015
"	no							10 00			"					yes	yes	3016
"											"					"	"	3017
"											"					no	no	3018
"	no										C. & W. M. U.				yes	yes	yes	3019
"									yes		"	no	no	no	"	"	"	3020
"									no		"	"	"	"	"	"	"	3021
"									"		"	"	"	"	"	"	"	3022
"									"		None					"	"	3023
"											"					"	no	3024
"											"					"	"	3025
"	yes	no	mort.	$150	7	yes	yes		yes		"					"	yes	3026
"	"	"	"	450	7	"	"		"	no	"					"	"	3027
"											"					"	"	3028
mo.											"					"	"	3029
"	yes	yes					yes		yes		"					"	"	3030
wk.											"					no	no	3031
"											"					yes	yes	3032
"											"					"	"	3033
"											"					"	"	3034
"											"					"	"	3035
"											"					no	no	3036
"											"					yes	yes	3037
"											"					"	"	3038
"											"					"	"	3039
"											"					"	"	3040
"	yes	yes					yes				"					"	"	3041
"									yes		"					"	"	3042
"	yes	yes					yes				"					"	"	3043
"									yes		"					"	"	3044
"	no							7 00			"					"	"	3045
s-mo.									yes		"					"	"	3046
"	yes	yes					yes		"		"					"	"	3047
mo.	"	"					"		"		"					"	"	3048
"											"					"	"	3049
"	no							7 00	yes		"					"	"	3050

Book No. 62.

Table No. 1.—Continued.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3051	Kalamazoo	40	Am.	----	m	2	2	Trimmer	day	10	----	$2 00	60	Lack of work	$506	$50
3052	“	30	“	----	s	--	--	“	pc.	10	no	2 25	none	----	704	----
3053	“	28	“	----	“	--	--	“	day	10	----	1 75	100	Lack of work	378	10
3054	“	21	“	----	“	--	--	“	pc.	10	----	1 50	150	“ “	245	none
3055	“	30	“	----	“	--	--	“	“	10	----	1 75	90	“ “	390	“
3056	“	35	“	----	m	2	3	“	“	10	----	2 00	60	“ “	506	75
3057	Jackson	18	Irish	----	s	--	--	“	day	10	yes	88	none	----	260	none
3058	“	24	Am.	----	“	--	--	“	“	10	“	2 00	60	Lack of work	506	“
3059	“	..	“	----	m	2	1	“	wk.	10	“	1 50	24	“ “ *	434	“
3060	“	20	“	----	s	--	--	“	day	10	“	1 66	18	“ “ *	500	“
3061	“	18	“	----	“	--	--	“	“	10	“	1 25	20	“ “	385	“
3062	“	22	“	----	“	--	--	“	“	10	“	1 25	150	“ “	210	“
3063	“	21	“	----	“	--	--	“	“	10	“	1 25	90	“ “	300	“
3064	“	23	“	----	“	--	--	“	“	10	no	1 00	* 100	“ “	213	“
3065	“	24	Irish	----	“	--	--	“	“	10	yes	1 50	60	“ “	400	“
3066	“	16	Am.	----	“	--	--	“	“	10	no	1 00	none	----	313	“
3067	“	20	Irish	----	“	--	--	“	pc.	10	“	2 00	12	Lack of work	602	40
3068	“	25	Can.	15	“	--	--	“	“	10	“	2 00	10	Sickness	606	none
3069	“	34	Scot.	33	m	2	--	“	“	10	“	2 00	none	----	626	50
3070	“	23	Ger.	----	s	--	--	“	day	10	“	2 00	“	----	626	none
3071	“	18	“	----	“	--	--	“	pc.	10	“	1 50	“	----	470	“
3072	“	16	“	----	“	--	--	“	day	10	“	80	“	----	250	“
3073	“	28	Am.	----	m	2	--	“	“	10	yes	2 50	“	----	783	400
3074	“	36	“	----	s	--	.	“	wk.	10	“	3 00	“	----	989	----
3075	“	20	“	----	“	--	--	“	day	10	no	1 25	14	Sickness	374	----
3076	“	20	Ger.	----	“	--	--	“	pc.	10	yes	1 25	235	----	98	----
3077	“	25	Am.	----	m	2	--	“	“	10	no	2 00	48	----	530	----
3078	“	21	Can.	4	s	--	--	“	“	10	“	2 00	none	----	626	100
3079	“	19	“	3	“	--	--	“	day	10	“	1 10	“	----	344	none
3080	“	21	Ger.	----	“	--	--	“	pc.	10	“	2 00	“	----	626	125
3081	Detroit	22	Am.	----	“	--	--	“	“	10	“	2 25	60	Lack of work	569	100
3082	Jackson	21	Irish	----	“	--	--	“	“	10	yes	1 75	none	----	548	75
3083	“	17	Am.	----	“	--	--	“	day	10	no	1 50	6	Sickness	461	none
3084	“	19	Ger.	----	“	--	--	“	“	10	“	1 25	18	Lack of work	361	“
3085	“	16	“	----	“	--	--	“	wk.	10	“	1 25	none	----	391	“
3086	“	18	Irish	----	“	--	--	“	day	10	“	1 25	6	Sickness	461	“
3087	“	17	Ger.	----	“	--	--	“	pc.	10	“	80	12	Lack of work	241	20
3088	“	21	Am.	----	“	--	--	“	“	10	“	1 40	15	“ “	417	30
3089	“	20	“	----	“	--	--	“	“	10	“	1 60	none	----	500	15
3090	“	50	“	----	m	2	1	“	“	10	“	2 25	“	----	704	none
3091	“	18	Ger.	----	s	--	--	“	wk.	10	“	66	“	----	209	“
3092	“	34	Am.	----	m	2	--	“	day	10	“	1 50	6	Sickness	461	100
3093	“	29	“	----	s	--	--	“	pc.	10	“	2 00	6	“	614	40
3094	“	18	Ger.	----	“	--	--	“	day	10	“	1 50	none	----	470	8
3095	“	19	Irish	----	“	--	--	“	“	10	“	1 50	“	----	470	38
3096	“	26	Am.	----	“	--	--	“	pc.	10	“	2 00	30	Lack of work	566	none
3097	“	26	“	----	“	--	--	“	“	10	“	2 00	none	----	626	100
3098	“	20	Ger.	----	“	--	--	“	“	10	“	1 75	6	Sickness	537	none
3099	“	20	“	----	“	--	--	“	“	10	“	2 00	6	“	614	50
3100	“	25	“	23	“	--	--	“	“	10	“	2 00	none	----	626	25

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
mo.	yes	no	mort.	$400	6	yes	yes				None					yes	yes	3051
"											"					"	"	3052
wk.									yes		"					"	"	3053
"											"					"	"	3054
"									yes		"					"	"	3055
"	no							$9 00	"		"					"	"	3056
s-mo.									no	no	"					"	no	3057
"									yes	"	"					"	yes	3058
"	no										"					"	"	3059
"											"					"	"	3060
"									no	no	"					"	"	3061
"											"					"	"	3062
"											"					"	"	3063
"											"					no	no	3064
"	yes	yes					yes				"					yes	yes	3065
wk.	no							7 50	no	no	"					"	"	3066
"									"	"	"					"	"	3067
"									"	"	"					"	"	3068
"	yes	yes					yes		yes	"	"					"	"	3069
"									"	"	"					"	"	3070
"									no	"	"					"	"	3071
"									"	"	"					"	"	3072
"	no							8 00	yes	"	"							3073
s-mo.	"							11 00	no	"	"					yes	yes	3074
"											"					"	"	3075
"											"					no	"	3076
"	no							12 00	yes	no	"					"	"	3077
wk.									no	"	"					yes	"	3078
"									"	"	"					"	"	3079
"									"	"	"					"	"	3080
s-mo.									"	"	"					"	"	3081
wk.									"	"	"					"	"	3082
"									"	"	"					"	"	3083
"									"	"	"					"	"	3084
"									"	"	"					"	"	3085
"									"	"	"					no	no	3086
"									"	"	"					yes	yes	3087
"									"	"	"					"	"	3088
"									"	"	"					"	"	3089
"	no							12 00	yes	yes	"					"	no	3090
"									no	no	"					"	yes	3091
"	yes	yes					yes		yes	"	"					"	"	3092
"									no	"	"					"	"	3093
"									"	"	"					"	"	3094
"									"	"	"					"	"	3095
"									"	"	"					"	"	3096
"	no							7 00	"	"	"					"	"	3097
"									"	"	"					"	"	3098
"	yes	no	mort.	300	8	yes	yes		"	"	"					"	"	3099
"									yes	"	"					"	"	3100

Book No. 63.

Table No. 1.—Continued.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3101	Jackson ----	50	Am.	----	m	2	3	Trimmer ----	day	10	yes	$2 50	none	----------------	$782	$200
3102	“ ----	25	“	----	s	--	--	“ ----	“	10	“	1 50	2	Sickness ------	466	none
3103	“ ----	28	“	----	m	2	1	“ ----	pc.	10	no	2 00	6	“ -----	614	100
3104	“ ----	20	“	----	s	--	--	“ ----	day	10	“	1 25	4	“ -----	386	15
3105	“ ----	18	“	----	“	--	..	“ ----	“	10	“	1 25	6	“ -----	384	25
3106	“ ----	17	“	----	“	--	--	“ ----	“	10	“	60	none	----------------	189	none
3107	“ ----	25	Can.	1	“	--	--	“ ----	“	10	“	1 16	3	Sickness ------	359	25
3108	“ ----	18	“	1	“	--	--	“ ----	wk.	10	“	50	1	“ -----	156	7
3109	“ ----	24	Irish	----	“	--	--	“ ----	day	10	“	1 25	1	“ -----	390	none
3110	“ ----	17	Ger.	----	“	--	--	“ ----	wk.	10	“	1 00	6	“ -----	307	20
3111	“ ----	26	Irish	----	“	--	--	“ ----	day	10	“	1 25	6	“ -----	384	none
3112	“ ----	18	“	----	“	--	--	“ ----	“	10	“	1 25	60	“ -----	316	“
3113	“ ----	28	“	26	“	--	--	“ ----	“	10	“	1 25	12	Pleasure -----	376	“
3114	“ ----	45	Am.	----	m	2	1	“ ----	“	10	yes	1 50	70	Lack of work	365	“
3115	“ ----	19	Irish	----	s	--	--	“ ----	“	10	no	1 00	18	----------------	295	“
3116	“ ----	17	“	----	“	--	--	“ ----	“	10	“	1 50	none	----------------	470	“
3117	“ ----	34	Am.	----	m	2	2	“ ----	wk.	10	yes	1 50	30	Lack of work	425	“
3118	“ ----	26	“	----	“	2	--	“ ----	day	10	“	2 00	36	“ “	554	50
3119	“ ----	37	“	----	“	2	4	“ ----	“	10	“	2 00	76	“ “	474	none
3120	“ ----	29	“	----	“	2	--	“ ----	“	10	“	2 00	30	Sickness -----	566	------
3121	“ ----	56	“	----	“	4	2	“ ----	“	10	no	1 75	156	Lack of work	275	none
3122	“ ----	28	“	----	s	--	--	“ ----	“	10	yes	1 50	30	“ “	425	50
3123	“ ----	24	“	----	“	--	--	“ ----	“	10	“	1 50	30	“ “	425	none
3124	“ ----	26	“	----	“	--	--	“ ----	pc.	10	no	1 70	65	“ “ *	422	25
3125	“ ----	20	“	----	“	--	--	“ ----	“	10	“	1 50	156	“ “ *	235	none
3126	“ ----	17	“	----	“	--	--	“ ----	day	10	“	60	60	Sickness ------	152	60
3127	“ ----	21	“	----	“	--	--	“ ----	pc.	10	“	2 00	100	Lack of work	426	none
3128	“ ----	26	Ger.	2	“	--	--	“ ----	“	10	“	2 00	non-	----------------	626	100
3129	“ ----	25	Am.	----	“	--	--	“ ----	“	10	“	2 50	180	Lack of work	332	none
3130	“ ----	23	Can.	3	“	--	--	“ ----	day	10	“	2 00	none	----------------	626	“
3131	“ ----	23	Am.	----	“	--	--	“ ----	“	10	“	1 50	45	Lack of work	402	“
3132	“ ----	36	“	----	“	--	--	“ ----	pc.	10	“	1 50	30	Sickness -----	424	“
3133	“ ----	22	“	----	“	--	--	“ ----	day	10	“	1 75	60	Lack of work	443	“
3134	Flint -------	25	“	----	“	--	--	“ ----	“	10	yes	2 25	none	----------------	704	“
3135	“ -------	25	“	----	m	--	--	“ ----	pc.	10	“	1 50	90	Lack of work	335	“
3136	“ -------	27	“	----	“	2	--	“ ----	“	10	“	1 70	120	“ “	328	100
3137	“ -------	33	“	----	“	2	3	“ ----	“	10	“	1 50	15	“ “	447	50
3138	“ -------	30	“	----	“	2	--	“ ----	“	10	“	1 50	20	“ “	440	75
3139	“ -------	20	“	----	s	--	--	“ ----	day	10	no	75	36	“ “ *	207	none
3140	“ -------	22	“	----	“	--	--	“ ----	“	10	“	75	128	“ “	139	20
3141	“ -------	20	“	----	“	--	--	“ ----	“	10	“	75	150	“ “	122	none
3142	“ -------	21	“	----	“	--	--	“ ----	pc.	10	“	2 50	90	“ “	557	100
3143	“ -------	27	“	----	m	2	1	“ ----	“	10	“	2 00	42	“ “	542	200
3144	“ -------	20	“	----	s	--	--	“ ----	“	10	“	2 50	120	“ “	475	75
3145	“ -------	23	“	----	m	2	--	“ ----	“	10	“	2 50	90	“ “	557	40
3146	“ -------	22	“	----	s	--	--	“ ----	“	10	“	2 50	60	“ “	632	none
3147	“ -------	18	“	----	“	--	--	“ ----	“	10	“	1 00	90	“ “	223	“
3148	“ -------	27	“	----	m	2		“ ----	“	10	“	2 00	120	“ “	386	75
3149	“ -------	22	“	----	s	--	--	“ ----	“	10	“	1 75	180	“ “	232	none
3150	“ -------	21	“	----	“	--	--	“ ----	“	10	“	2 00	90	“ “	446	50

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance.	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	yes	no	cont.	$500	6	yes	yes		yes		None					yes	no	3101
"									no		"					"	"	3102
"	yes	no	cont.	1,300	6	yes	yes		yes	no	"					"	yes	3103
"									no	"	"					"	"	3104
"									"	"	"					no	no	3105
"									"	"	"					yes	yes	3106
"									yes	"	"					no	no	3107
"									no	"	"					"	"	3108
"									"	"	"					"	yes	3109
"									"	"	"					"	"	3110
"									"	"	"					"	"	3111
"									"	"	"					"	"	3112
"									"	"	Iron Moulders' Un.	yes	yes	yes	yes	"	"	3113
"	no							$9 00	yes	"	None					"	"	3114
"									no	"	"					"	"	3115
"									"	"	"					"	"	3116
"	no										"					"	no	3117
"	"							8 00	yes		"					"	yes	3118
"	"							8 00	"		"					yes	no	3119
"	"							10 00	"		"					"	"	3120
"	"								no		"					"	yes	3121
"									"		"					"	no	3122
"									yes		"					"	"	3123
s-mo.									no		"					"	yes	3124
"											"					no	no	3125
											"							3126
s-mo.											"					yes	yes	3127
"											"					no	no	3128
"									yes		"					yes		3129
"									no		"					"	yes	3130
"									yes		"					"	"	3131
"	no							7 00			"					"	"	3132
"											"					"	"	3133
wk.									no	no	"					no	"	3134
"	no							6 50	"	"	"					yes	"	3135
"	"							4 00	"	"	"					"	"	3136
"	"							6 00	yes	"	"					"	"	3137
"	"								"	"	"					"	"	3138
"										"	"					"	"	3139
"										"	"					"	"	3140
"										"	"					"	"	3141
"										"	"					"	"	3142
"	no							5 00	yes	"	"					"	"	3143
"									no	yes	"					"	"	3144
"	no							7 50	"	"	"					"	"	3145
"									"	no	"					"	"	3146
"									"	"	"					"	"	3147
"	no							3 50	"	"	"					"	"	3148
"									"	"	"					"	"	3149
"										"	"					"	"	3150

Book No. 64. **Table No. 1.—CONTINUED.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3151	Flint -------	31	Am.	----	m	2	3	Trimmer----	day	10	no	$2 25	90	Lack of work	$511	none
3152	" -------	40	"	----	"	2	2	" ----	pc.	10	"	1 75	120	" "	337	"
3153	" -------	24	"	----	s	--	--	" ----	day	10	"	2 00	36	" "	554	"
3154	" -------	23	Can.	6	"	--	--	" ----	"	10	"	2 50	18	" " *	788	"
3155	" -------	51	Am.	----	m	2	1	" ----	"	10	"	1 50	none	---------------	470	"
3156	" -------	28	"	----	"	2	--	" ----	"	10	"	2 25	50	Lack of work	592	$150
3157	" -------	23	"	----	s	--	--	" ----	"	10	"	75	120	" " *	145	none
3158	" -------	20	"	----	"	--	--	" ----	"	10	"	75	90	" " *	167	"
3159	" -------	18	"	----	"	--	--	" ----	"	10	"	75	30	" " *	212	"
3160	" -------	22	"	----	"	--	--	" ----	pc.	10	"	1 50	120	" "	290	"
3161	" -------	34	"	----	"	--	--	" ----	"	10	"	1 50	90	" "	335	"
3162	" -------	16	"	----	"	--	--	" ----	day	10	"	58	90	" "	129	"
3163	" -------	27	"	----	m	2	2	" ----	"	10	"	1 25	120	" "	241	"
3164	" -------	26	"	----	"	2	-	" ----	"	10	"	1 25	20	" "	366	"
3165	" -------	25	"	----	s	--	--	" ----	"	10	"	1 00	none	---------------	313	50
3166	" -------	22	"	----	"	--	--	" ----	"	10	"	75	150	Lack of work	122	none
3167	" -------	19	"	----	"	--	--	" ----	"	10	"	1 00	250	At school----	63	"
3168	" -------	20	"	----	"	--	--	" ----	"	10	"	75	200	" ----	84	"
3169	" -------	16	"	----	"	--	--	" ----	"	10	"	75	203	Other work--	85	"
3170	" -------	18	"	----	"	--	--	" ----	wk.	10	yes	75	152	Lack of work	113	"
3171	" -------	18	Can.	7	"	--	--	" ----	pc.	10	"	1 00	156	" "	157	"
3172	" -------	20	Am.	----	m	2	--	" ----	"	10	no	1 50	150	" "	245	"
3173	" -------	20	"	----	s	--	--	" ----	wk.	10	yes	70	180	" "	98	"
3174	" -------	23	"	----	m	2	--	" ----	pc.	10	"	2 00	none	---------------	626	200
3175	" -------	22	"	----	"	2	--	" ----	day	10	"	2 00	60	Lack of work	506	------
3176	" -------	26	"	----	"	2	--	" ----	pc.	10	"	2 00	none	---------------	626	100
3177	" -------	22	"	----	"	2	--	" ----	day	10	"	2 50	"	---------------	783	400
3178	" -------	17	"	----	s	--	--	" ----	"	10	"	83	10	Sickness -----	251	none
3179	" -------	20	"	----	"	--	--	" ----	pc.	10	"	1 50	none	---------------	470	100
3180	" -------	20	"	----	"	--	--	" ----	"	10	"	1 70	"	---------------	532	60
3181	" -------	48	"	----	m	2	3	" ----	"	10	"	1 75	90	Lack of work	390	none
3182	" -------	52	"	----	w	1	1	" ----	"	10	"	1 25	20	" "	366	"
3183	" -------	17	"	----	s	--	--	" ----	"	10	"	75	40	" "	205	"
3184	" -------	49	"	----	m	2	1	" ----	"	10	"	1 25	90	" "	279	"
3185	" -------	36	"	----	s	2	1	" ----	"	10	"	50	14	" "	150	"
3186	" -------	28	"	----	m	2	2	" ----	"	10	"	2 00	80	" "	466	100
3187	" -------	17	"	----	s	--	--	" ----	day	10	"	67	12	" "	201	none
3188	Detroit-----	56	Eng.	38	m	2	--	" ----	"	10	no	2 50	209	" "	260	"
3189	" -----	37	Am.	----	"	2	1	" ----	pc.	10	"	2 50	12	" "	753	------
3190	" -----	43	Ger.	----	"	2	4	" ----	wk.	10	"	2 00	157	Sickness -----	812	none
3191	" -----	28	Am.	----	"	2	--	" ----	pc.	10	"	2 25	90	Lack of work	502	50
3192	" -----	23	"	----	s	--	--	" ----	"	10	"	2 00	none	---------------	626	100
3193	" -----	22	"	----	"	--	--	" ----	"	10	"	2 00	"	---------------	626	100
3194	" -----	25	"	----	"	--	--	" ----	"	10	"	2 00	60	Lack of work	506	100
3195	" -----	22	"	----	"	--	--	" ----	"	10	"	2 50	none	---------------	788	200
3196	" -----	24	"	----	"	--	--	" ----	"	10	"	2 00	90	Lack of work	446	50
3197	" -----	21	"	----	"	--	--	" ----	"	10	----	1 50	none	---------------	470	100
3198	" -----	24	"	----	"	--	--	" ----	"	10	no	1 50	"	---------------	470	100
3199	" -----	40	"	----	m	2	3	" ----	"	10	"	2 00	60	Lack of work	506	none
3200	" -----	21	"	----	s	--	--	" ----	"	10	"	2 50	60	" "	633	100

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* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	yes	no	cont.	$775	7	yes	yes	----	yes	yes	None	----	----	----	----	yes	yes	3151
"	no	----	----	----	----	----	----	$7 00	"	no	"	----	----	----	----	"	"	3152
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3153
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3154
"	yes	no	mort.	500	7	yes	yes	----	no	----	"	----	----	----	----	"	"	3155
"	"	yes	----	----	----	----	"	----	yes	no	"	----	----	----	----	"	"	3156
"	----	----	----	----	----	----	----	----	----	"	"	----	----	----	----	"	"	3157
"	----	----	----	----	----	----	----	----	----	"	"	----	----	----	----	"	"	3158
"	----	----	----	----	----	----	----	----	----	"	"	----	----	----	----	"	"	3159
"	----	----	----	----	----	----	----	----	yes	"	"	----	----	----	----	"	"	3160
"	yes	no	cont.	----	6	yes	yes	----	"	yes	"	----	----	----	----	"	"	3161
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	3162
"	no	----	----	----	----	----	----	5 00	----	"	"	----	----	----	----	"	"	3163
"	yes	no	mort.	200	6	yes	yes	----	----	"	"	----	----	----	----	"	"	3164
"	----	----	----	----	----	----	----	----	----	"	"	----	----	----	----	"	"	3165
"	----	----	----	----	----	----	----	----	----	"	"	----	----	----	----	"	"	3166
"	----	----	----	----	----	----	----	----	yes	"	"	----	----	----	----	"	"	3167
"	----	----	----	----	----	----	----	----	----	"	"	----	----	----	----	"	"	3168
"	----	----	----	----	----	----	----	----	----	"	"	----	----	----	----	"	"	3169
"	----	----	----	----	----	----	----	----	yes	----	"	----	----	----	----	"	"	3170
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	3171
"	no	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3172
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3173
"	no	----	----	----	----	----	----	----	yes	"	"	----	----	----	----	"	"	3174
"	"	----	----	----	----	----	----	----	"	----	"	----	----	----	----	"	"	3175
"	"	----	----	----	----	----	----	7 50	"	yes	"	----	----	----	----	"	"	3176
"	"	----	----	----	----	----	----	10 00	"	"	"	----	----	----	----	"	"	3177
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	3178
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	3179
"	no	----	----	----	----	----	----	10 00	"	"	"	----	----	----	----	"	"	3180
s-mo.	"	----	----	----	----	----	----	8 00	"	"	"	----	----	----	----	"	no	3181
"	"	----	----	----	----	----	----	----	yes	yes	"	----	----	----	----	"	yes	3182
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	3183
"	yes	yes	----	----	----	----	yes	----	yes	"	"	----	----	----	----	no	no	3184
"	no	----	----	----	----	----	----	8 00	no	"	"	----	----	----	----	yes	yes	3185
"	"	----	----	----	----	----	----	8 25	yes	"	"	----	----	----	----	"	"	3186
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3187
wk.	no	----	----	----	----	----	----	25 00	"	"	"	----	----	----	----	"	no	3188
"	yes	no	cont.	675	7	no	yes	----	"	----	"	----	----	----	----	no	"	3189
"	"	"	mort.	200	7	yes	"	----	"	no	"	----	----	----	----	"	"	3190
s-mo.	no	----	----	----	----	----	----	10 00	no	"	"	----	----	----	----	yes	yes	3191
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3192
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3193
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3194
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3195
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3196
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3197
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3198
"	no	----	----	----	----	----	----	12 00	"	"	"	----	----	----	----	"	"	3199
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3200

Book No. 65. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3201	Detroit	26	Am.		s			Trimmer	pc.	10	no	$2 25	60	Lack of work	$569	$100
3202	"	23	"		"			"	day	10	"	1 25	60	" "	316	none
3203	"	21	"		"			"	"	10	"	1 25	90	" "	279	"
3204	"	24	"		"			"	pc.	10	"	1 50	30	" "	425	100
3205	"	21	"		"			"	"	10	"	1 00	60	" "	253	none
3206	"	28	"		m	2	1	"	"	10	"	2 25	none		704	100
3207	"	22	"		s			"	day	10	"	1 25	"		391	none
3208	"	22	"		"			"	pc.	10	"	1 25	60	Lack of work	316	"
3209	"	19	Ger.	5	"			"	day	10	"	1 00	none		313	"
3210	"	25	Am.		m	2	1	"	pc.	10	"	2 25	"		704	"
3211	"	36	"		"	2	4	"	yr.	10	yes	3 20	"		1,000	100
3212	"	38	"		"	2	1	"	day	10	no	2 75	14	Vacation	825	50
3213	"	38	Can.	20	"	2	1	"	wk.	10	"	2 12	18	Lack of work	625	
3214	"	30	Am.		s			"	"	10	"	1 75	16		519	
3215	"	15	"		"			"	"	10	"	33	1	Sickness	103	
3216	"	40	Ger.	25	m	2	2	"	"	10	"	1 75	40	Lack of work	477	none
3217	"	30	Am.		"	2	1	"	pc.	10		2 00	none		626	100
3218	"	25	"		s			"	day	10	yes	1 70	"		550	300
3219	"	20	Ger.	18	"			"	"	10	no	1 00	"		313	none
3220	"	26	Am.		m	2		"	"	10	"	2 00	30	Lack of work	566	"
3221	"	24	"		s			"	"	10	"	1 00	150	" "	163	"
3222	"	25	"		m	2		"	"	10	yes	2 10	50	" "	552	100
3223	Charlotte	19	"		s			"	pc.	10	"	1 25	60	" "	316	none
3224	"	18	"		"			"	"	10	"	80	90	" "	178	"
3225	"	28	"		m	2	1	"	"	10	"	3 00	13		900	400
3226	"	19	"		s			"	"	10	"	75	90	Lack of work	167	none
3227	"	26	"		"			"	"	10	"	1 50	100	" "	320	"
3228	"	22	"		"			"	"	10	no	75	100	" "	160	"
3229	"	24	"		"			"	day	10	yes	1 50	60	" "	379	"
3230	"	33	"		m	2	3	"	pc.	10	"	1 40	100	" "	298	"
3231	"	20	"		s			"	"	10	"	85	90	" "	189	"
3232	"	20	"		"			"	"	10	"	75	100	" "	160	"
3233	"	17	"		"			"	"	10	no	50	200	" "	56	5
3234	"	18	"		"			"	"	10	"	60	100	" "	128	none
3235	"	32	"		m	2	1	"	wk.	10	yes	2 00	none		626	200
3236	"	19	"		s			"	pc.	10	"	75	150	Lack of work	122	none
3237	"	17	"		"			"	"	10	no	50	200	" "	57	18
3238	"	19	"		"			"	"	10	yes	75	125	" "	141	none
3239	"	34	"		m	3	1	"	wk	10	"	1 75	60	" "	442	"
3240	"	18	"		s			"	pc.	10		50	200	" "	57	"
3241	"	26	"		m	2	1	"	"	10	yes	1 10	90	" "	245	"
3242	"	18	"		s			"	"	10	"	75	100	" "	160	60
3243	"	48	Can.	15	m	2	2	"	day	10	"	2 00	35	" "	556	200
3244	"	22	Am.		s			"	pc.	10	no	1 00	90	" "	223	none
3245	Pontiac	24	"		m	2	1	"	"	10	yes	1 25	156	" "	340	"
3246	"	21	"		s			"	day	10	no	1 00	104	" "	209	10
3247	"	37	Eng.	25	m	2		"	"	10	"	2 25	52	" "	587	none
3248	"	27	Am.		s			"	"	10	"	1 00	72	Sickness	241	90
3249	"	21	"		"			"	"	10	"	75	72	"	181	none
3250	"	18	"		"			"	"	10	"	1 25	10		379	"

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance.	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.	----	----	----	----	----	----	----	----	no	no	None	----	----	----	----	yes	yes	3201
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3202
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3203
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3204
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3205
"	no	----	----	----	----	----	----	$12 00	yes	"	"	----	----	----	----	"	"	3206
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	3207
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3208
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3209
"	no	----	----	----	----	----	----	12 00	yes	"	"	----	----	----	----	"	"	3210
"	"	----	----	----	----	----	----	12 00	"	"	"	----	----	----	----	"	"	3211
wk.	"	----	----	----	----	----	--	15 00	"	----	"	----	----	----	----	"	"	3212
"	"	----	----	----	----	----	----	12 00	----	----	"	----	----	----	----	"	----	3213
"	----	----	----	----	----	----	----	----	no	----	"	----	----	----	----	"	yes	3214
"	yes	yes	----	----	----	----	yes	----	yes	----	"	----	----	----	----	"	no	3215
"	no	--	----	----	----	----	----	9 00	no	no	"	----	----	----	----	"	"	3216
"	"	----	----	----	----	--	----	6 00	yes	----	"	----	----	----	----	"	"	3217
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	----	3218
s-mo.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	yes	3219
"	yes	no	mort.	----	7	yes	yes	----	yes	no	"	----	----	----	----	"	"	3220
"	----	----	----	----	----	----	--	----	----	----	Steam Fitters' Un.	----	----	----	yes	"	"	3221
wk.	no	--	----	----	----	----	----	----	no	no	None	----	----	----	----	"	"	3222
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3223
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3224
"	yes	no	cont.	----	----	yes	yes	----	"	"	"	----	----	----	----	"	no	3225
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3226
"	----	----	----	----	----	----	----	----	yes	"	"	----	----	----	----	"	yes	3227
"	--	----	----	----	----	----	----	----	"	yes	"	----	----	----	----	"	"	3228
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	3229
"	no	----	----	----	----	----	----	6 00	"	"	"	--	----	----	----	"	"	3230
"	----	--	----	----	----	----	----	----	yes	yes	"	----	----	----	----	"	"	3231
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	3232
"	----	----	----	----	--	----	----	----	--	----	"	----	----	----	----	"	"	3233
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	no	3234
"	no	----	----	----	----	----	----	6 00	no	no	"	----	----	----	----	"	"	3235
"	----	----	----	----	----	----	----	----	yes	yes	"	----	----	----	----	"	yes	3236
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	no	3237
"	----	----	----	----	----	----	----	----	ye	"	"	----	----	----	----	"	yes	3238
"	no	----	----	----	----	----	----	7 00	"	"	"	----	----	----	----	"	no	3239
"	----	----	----	----	----	----	----	----	no	"	"	----	--	----	----	"	yes	3240
"	no	----	----	----	----	----	----	6 00	yes	"	"	----	----	----	----	"	"	3241
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	no	3242
"	yes	yes	----	----	----	----	yes	----	yes	"	"	----	----	----	----	no	"	3243
"	----	----	----	----	----	----	----	----	"	yes	"	----	----	----	----	yes	yes	3244
"	no	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	3245
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3246
"	no	----	----	----	----	----	----	8 00	yes	"	"	----	----	----	----	"	"	3247
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	3248
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	3249
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	3250

Book No. 66. **Table No. 1.—CONTINUED.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3251	Pontiac	29	Am.	----	s	--	--	Trimmer	day	10	no	$2 50	10	Vacation	$758	$300
3252	"	20	"	----	"	--	--	"	"	10	"	1 75	48	Sickness	463	200
3253	"	32	"	----	"	--	--	"	"	10	"	1 75	10	Vacation	530	none
3254	"	23	"	----	"	--	--	"	pc.	10	"	1 25	10	"	379	"
3255	"	21	"	----	"	--	--	"	day	10	"	1 25	72	Lack of work	301	150
3256	"	29	"	----	"	--	--	"	"	10	"	1 00	72	Sickness	241	50
3257	"	19	"	----	"	--	--	"	"	10	"	80	none	----	250	none
3258	"	18	"	----	"	--	--	"	"	10	"	75	18	Lack of work	221	"
3259	"	21	"	----	"	--	--	"	"	10	"	1 50	18	Sickness*	443	25
3260	"	36	------	4	m	2	1	"	wk.	10	----	2 50	none	----	783	----
3261	"	16	Am.	----	s	--	--	"	day	10	no	80	60	Sickness*	202	none
3262	Ovid	26	"	----	"	--	--	"	pc.	10	"	1 50	130	Other work	275	----
3263	"	21	"	----	"	--	--	"	day	10	"	1 25	104	" "	136	none
3264	"	19	"	----	"	--	--	"	"	10	"	75	208	" "	79	"
3265	"	20	"	----	"	--	--	"	"	10	"	1 50	52	" "	390	"
3266	"	22	"	----	"	--	--	"	"	10	"	1 00	156	" "	157	"
3267	"	46	"	----	m	2	2	"	pc.	10	"	1 60	150	" "	261	"
3268	"	27	"	----	"	2	1	"	"	9	"	1 50	80	Lack of work	350	----
3269	"	19	"	----	s	--	--	"	"	10	"	1 25	100	Other work	266	----
3270	"	20	"	----	"	--	--	"	day	10	"	1 00	125	" "	188	----
3271	G'd Rapids	35	"	----	m	2	--	"	"	10	"	1 10	78	Lack of work	259	none
3272	Allegan	25	"	----	s	--	--	"	pc.	10	"	2 25	78	" "	529	"
3273	G'd Rapids	21	"	----	"	--	--	"	wk.	10	"	1 66	6	Pleasure	510	100
3274	"	17	"	----	"	--	--	"	pc.	10	"	70	156	Lack of work	110	none
3275	"	35	Ger.	22	m	2	1	"	day	10	----	2 00	none	----	626	"
3276	"	38	Can.	20	"	2	3	"	pc.	10	no	3 00	"	----	939	----
3277	"	26	Am.	----	s	--	--	"	day	10	"	1 50	52	Lack of work	392	200
3278	"	28	Pol.	25	m	2	2	"	"	10	yes	2 00	52	" "	522	none
3279	"	39	Ger.	----	"	2	--	"	"	10	no	1 25	52	Sickness	326	"
3280	"	38	Can.	----	w	1	4	"	"	10	yes	1 60	156	Lack of work	314	"
3281	Albion	26	Am.	----	m	2	1	"	"	10	no	2 00	60	Sickness	506	"
3282	"	44	"	----	"	2	3	"	"	10	yes	3 00	none	----	939	400
3283	"	21	"	----	s	--	--	"	"	10	no	2 25	25	----	648	100
3284	"	30	"	----	m	3	3	"	"	10	"	2 50	13	----	750	none
3285	"	21	"	----	"	2	--	"	"	10	"	2 00	10	----	606	100
3286	"	35	"	----	s	--	--	"	"	10	"	2 50	30	----	708	100
3287	"	15	"	----	"	--	--	"	"	10	"	1 00	263	----	50	----
3288	"	31	"	----	m	2	3	"	"	10	"	2 25	15	----	671	----
3289	Lansing	21	"	----	s	--	--	"	"	10	"	1 10	14	Sickness	328	none
3290	"	34	"	----	"	--	--	"	pc.	10	"	2 00	60	" *	506	1
3291	"	26	Can.	----	"	--	--	"	"	10	"	1 75	90	Lack of work	390	50
3292	"	28	Am.	----	"	--	--	"	"	10	"	1 50	12	" "	451	none
3293	"	25	"	----	m	2	1	"	day	10	"	1 50	15	" "	451	100
3294	"	19	"	----	s	--	--	"	"	10	"	70	30	" "	198	none
3295	"	26	"	----	m	2	1	"	"	10	"	1 50	75	" "	357	----
3296	"	38	"	----	"	3	--	"	"	9	"	2 00	78	" "	470	----
3297	Three Rivers	40	"	----	"	2	2	"	pc.	10	yes	2 25	10	Pleasure	682	175
3298	" "	18	"	----	s	--	--	"	"	10	no	2 25	30	" *	637	200
3299	" "	16	"	----	"	--	--	"	"	10	yes	50	none	----	157	none
3300	" "	32	"	----	m	2	--	"	day	10	no	2 00	90	Lack of work	446	150

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* And lack of work.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.											None					yes	yes	3251
"											"					"	"	3252
"											"					"	"	3253
"											"					"	"	3254
"											"					"	"	3255
"											"					"	"	3256
"											"					"	no	3257
"											"					no	"	3258
"											"					yes	"	3259
"	no								yes	no	"					"	"	3260
"											"					"	yes	3261
s-mo.											"					"	"	3262
"									no	no	"					"	"	3263
"									"	"	"					"	no	3264
"									"	"	"					"	"	3265
"									"	"	"					"	yes	3266
"	yes	no	cont.	$150	7	yes	yes		"		"					"		3267
"	no								yes		"					"		3268
"									no	no	"					no	no	3269
"										"	"					yes	yes	3270
"	no							$4 00	no	"	"					"	"	3271
wk.									yes	"	"					"	"	3272
"									no	"	"					"	"	3273
"									"	"	"					"	"	3274
"	no							5 00	yes	"	"					"	no	3275
"	"							10 00	no	"	"					"	"	3276
"	yes	no	mort.	600	7	yes	yes		"	"	"					"	yes	3277
"	no							6 00	yes	"	"						"	3278
s-mo.	"							3 50	"	"	"					yes	yes	3279
"	"								no	"	"					"	"	3280
wk.	"							8 00	yes	"	"					"	"	3281
	yes	yes					no		"	"	"					no	no	3282
wk.											"					yes	yes	3283
"	yes	no	mort.	300	7	yes	yes		yes	yes	"					"	"	3284
"	no							7 50	"	no	"					"	"	3285
"									"	"	"					"	"	3286
"											"					"	no	3287
"	yes	yes					no		yes	no	"					"	yes	3288
											"					"	no	3289
wk.											"					"	yes	3290
"									no	no	"					"	no	3291
"									"	"	"					"	"	3292
"	yes	no	mort.	400	7	yes	yes		"	"	"					"	yes	3293
s-mo.											"					"	"	3294
"	yes	no	mort.	750	7	yes	yes		yes	no	"					"	"	3295
"	no							10 00	no	"	"					"	"	3296
wk.	"							10 00			"					"	no	3297
"									no		"					"	"	3298
"											"					"	yes	3299
	no							10 00	no		"					"	no	3300

Book No. 67. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3301	Three Rivers	24	Am.	....	s	--	--	Trimmer	pc.	10	yes	$2 00	30	Sickness*	$566	$200
3302	"	30	"	....	m	2	--	"	wk.	10	no	2 00	none	....	626	none
3303	"	35	"	....	"	2	1	"	pc.	10	yes	2 00	30	Lack of work	566	"
3304	"	23	"	....	s	--	--	"	"	10	"	2 00	30	" "	566	225
3305	"	28	"	....	m	2	2	"	day	10	no	2 25	11	Sickness	679	none
3306	Jonesville	25	"	....	s	--	--	"	"	10	"	1 75	90	Lack of work	390	75
3307	"	21	"	....	"	--	--	"	"	10	"	75	90	" "	167	none
3308	"	19	"	....	"	--	--	"	"	10	"	83	120	" "	160	"
3309	"	19	Irish	....	"	--	--	"	"	10	"	83	90	" "	185	"
3310	"	25	Am.	....	m	2	1	"	"	10	"	75	75	" "	476	......
3311	"	38	"	....	"	2	--	"	pc.	10	yes	2 50	10	Other work*	758	none
3312	"	26	"	....	s	--	--	"	day	10	no	1 50	90	Lack of work	335	"
3313	Wayne	42	"	....	m	2	3	"	"	10	yes	2 50	none	....	783	150
3314	"	21	"	....	s	--	--	"	pc.	10	"	1 50	30	Lack of work	425	50
3315	"	18	"	....	"	--	--	"	"	10	"	1 50	30	" "*	425	75
3316	"	25	Can.	3	m	2	2	"	"	10	no	2 00	30	" "	566	......
3317	"	25	Am.	....	s	--	--	"	"	10	yes	1 25	90	" "	279	none
3318	Marshall	25	"	....	"	--	--	"	day	10	"	2 50	60	Vacation†	633	"
3319	"	21	"	....	"	--	--	"	"	10	"	1 00	30	"	283	25
3320	"	28	"	....	"	--	--	"	"	10	"	2 50	30	"	707	200
3321	"	22	Ger.	....	"	--	--	"	"	10	"	1 50	60	Lack of work	280	100
3322	White Pigeon	28	Am.	....	m	2	--	"	"	10	"	1 75	30	" "	495	none
3323	" "	22	"	....	s	--	--	"	"	10	"	1 00	20	" "	293	"
3324	" "	30	"	....	m	2	--	"	"	10	"	1 75	70	" "	425	"
3325	" "	45	"	....	"	2	2	"	"	10	"	2 00	12	Sickness	602	"
3326	Owosso	24	"	....	s	--	--	"	pc.	10	no	2 00	60	Lack of work	506	"
3327	"	20	"	....	"	--	--	"	day	10	"	75	100	" "	266	20
3328	"	22	"	....	m	2	--	"	"	10	"	1 25	150	" "	204	none
3329	"	35	"	....	"	2	2	"	"	10	yes	2 50	84	" "	573	75
3330	Coldwater	24	"	....	"	2	--	"	pc.	10	no	2 35	82	" "	550	......
3331	"	18	"	....	s	--	--	"	hr.	10	"	1 00	233	Sickness	80	none
3332	Romeo	38	"	....	m	2	--	"	day	10	"	2 50	150	Lack of work	407	"
3333	"	38	"	....	"	2	--	"	pc.	10	"	2 50	157	" "	390	"
3334	Linden	31	"	....	"	2	4	"	"	10	"	1 75	125	" "	329	"
3335	"	44	"	....	s	--	--	"	"	10	yes	1 75	15	" "	521	"
3336	Benton H'b'r	20	Ger.	....	"	--	--	"	day	10	no	1 50	15	Vacation	447	150
3337	Traverse City	26	Boh.	....	"	--	--	"	"	10	"	2 00	52	"	522	100
3338	Lapeer	20	Am.	...	"	--	--	"	"	10	"	1 50	130	Lack of work	275	none
3339	South Lyon	35	Can.	20	m	2	2	"	"	10	"	2 50	78	" "	587	"
3340	Manistee	54	Eng.	26	"	2	5	"	"	10	"	2 25	156	" "	35	"
3341	Monroe	25	Am.	....	s	--	--	"	"	10	yes	1 50	180	" "‡	200	50
3342	Mt. Clemens	40	Ger.	37	m	2	3	"	"	10	no	2 00	30	" "	566	175
3343	Bay City	33	Am.	....	"	2	1	Toolmaker	"	10	"	2 25	105	" "†	468	none
3344	" "	25	"	...	"	2	1	" "	"	10	yes	2 50	15	Vacation	745	"
3345	" "	27	"	....	s	--	--	" "	"	10	"	2 50	10	"	758	300
3346	" "	29	"	....	m	2	1	" "	"	10	"	2 65	10	"	803	none
3347	" "	34	"	....	"	2	4	" "	"	10	"	2 60	10	Sickness	788	"
3348	G'd Rapids	34	Dane	17	"	2	3	" "	"	10	"	2 75	104	Pleasure	605	"
3349	"	27	Am.	....	"	2	1	" "	"	10	"	2 50	12	Lack of work	753	"
3350	Detroit	49	"	....	"	3	2	" "	"	10	"	3 00	150	" "	489	200

* And pleasure.
† And sickness.
‡ And holidays.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.									yes		None					yes	yes	3301
"	no							$10 00	"	no	"					"	no	3302
"	"							6 00	no		"					"	yes	3303
"									yes	no	"					"	"	3304
"	yes	no	mort.	$300	7	yes	yes				"					"	no	3305
s-mo.									no	no	"					"	yes	3306
"									"	"	"					"	"	3307
"									"	"	"					"	no	3308
"									"	"	"					"	yes	3309
"	yes	yes					yes		yes	"	"					"	no	3310
"	"	no	mort.	400	6	yes	"			yes	"					"	yes	3311
"									yes	no	"					"	"	3312
"	yes	yes					yes		"	"	"					"	"	3313
"											"					"	"	3314
"											"					"	"	3315
"	no							7 00			"					"	"	3316
"									yes	no	"					"	"	3317
wk.									no		"					"	"	3318
"											"					"	no	3319
"											"					"	yes	3320
"											"					"	"	3321
s-mo.	no								no		"					"	"	3322
"									"		"					"	"	3323
"	no							5 00			"					"	"	3324
"	"							5 00	yes		"					"	"	3325
wk.									"	no	"					"	"	3326
"											"					"	"	3327
"	no							6 00	no	no	"					"	no	3328
"	"							6 00	yes	"	"					"	"	3329
"	"							9 00	"	"	"					"	"	3330
"									no	"	"					"	"	3331
"	no							3 00	yes	"	"					"	yes	3332
"	"							3 00	"	"	"					"	"	3333
"	"								"	"	"					"	"	3334
"											"					"	"	3335
"											"					"	"	3336
"											"					no	no	3337
"											"					yes	yes	3338
"	no							5 00			"					"	"	3339
"	yes	no	mort.	100	7	yes	yes				"					"	"	3340
"											"					"	"	3341
"	yes	no	cont.	750	7	yes	yes		yes	no	*	no	yes	no	no	"	no	3342
"	no							7 00	no	"	None					"	yes	3343
"	"							7 00	"	"	B. of B. M.	no	no	no	yes	"	"	3344
"									yes	"	None					"	"	3345
"	no							9 00	"	"	B. of B. M.	no	no	no	no	"	"	3346
"	"							9 50	"	"	None					"	"	3347
"	yes	no	mort.	400	6	yes	yes		"	"	I. A. of M.	yes	yes	yes	yes	"	"	3348
"	no							8 00	"	yes	None					"	"	3349
"	yes	yes					yes				"							3350

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* Donaldson Bros. Employés' Sick and Accident Benefit Association.

Book No. 68. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3351	Three Rivers	49	Am.	----	m	2	1	Moulder	day	10	no	$1 16	36	Sickness	$321	none
3352	" "	20	"	----	s	-	--	"	"	10	yes	1 00	277	Lack of work	36	"
3353	" "	30	Ger.	21	m	2	3	"	"	10	"	1 16	12	Sickness	350	"
3354	" "	17	Am.	----	s	--	--	"	"	10	no	91	12	Lack of work	274	$50
3355	" "	17	Ger.	14	"	--		"	"	10	yes	75	78	" "	175	none
3356	" "	52	Am.	----	m	6	4	"	"	10	no	2 00	6	Sickness	614	50
3357	" "	42	"	----	"	2	5	"	"	10	"	1 53	52	Lack of work	400	none
3358	" "	32	"	----	"	2	1	"	"	10	"	83	10	Sickness	250	"
3359	" "	19	"	----	s	--	--	"	"	10	yes	83	89	Lack of work	227	"
3360	" "	28	"	----	"	--	--	"	"	10	"	90	26	" "	282	"
3361	" "	29	Ger.	24	m	3	2	"	"	10	no	1 40	12	" "	421	"
3362	" "	17	Am.	----	s	--	--	"	"	10	"	80	156	Vacation	126	"
3363	" "	24	"	----	"	--	-	"	"	10	yes	1 33	48	Lack of work	352	"
3364	" "	40	"	----	m	2	1	"	"	10	"	1 54	20	" "	450	50
3365	" "	20	"	----	s	--	--	"	"	10	"	75	12	" "	225	none
3366	" "	21	"	----	"	2	1	"	"	10	"	1 33	12	" "	400	"
3367	" "	19	"	----	"	--	--	"	"	10	no	74	10	" "	225	"
3368	Mt. Clemens	22	"	----	"	--	--	"	"	10	"	1 37	18	Sickness*	404	25
3369	"	24	Fr.	----	m	2	2	"	"	10	"	1 50	20	"	485	none
3370	"	54	"	----	"	2	1	"	"	10	"	1 75	20	" *	507	50
3371	"	27	Am.	----	"	2	1	"	"	10	"	1 75	26	" *	502	200
3372	"	27	Irish	12	s	--	--	"	"	10	"	1 75	60	"	448	none
3373	"	23	Am.	----	"	--	--	"	"	10	"	1 37	30	Pleasure*	347	"
3374	"	33	Ger.	----	m	2	-	"	"	10	"	1 75	20	Sickness*	512	100
3375	"	29	"	----	"	2	3	"	"	10	"	1 75	20	" †	512	50
3376	Lansing	26	Am.	----	"	2	1	"	pc.	10	"	2 25	20	" *	659	200
3377	"	33	"	----	"	2	1	"	"	10	"	2 48	30	"	702	300
3378	"	38	"	----	"	2	-	"	"	10	"	2 00	23	"	580	50
3379	"	32	"	----	"	2	3	"	"	10	"	2 00	103	" *	420	none
3380	"	23	"	----	s	--	--	"	"	10	"	2 00	13	Lack of work	600	75
3381	G'd Rapids	42	Nor.	8	m	2	6	Filer	day	10	yes	1 50	30	" "	483	none
3382	"	42	Ger.	16	"	2	3	"	"	10	"	1 25	36	" "	395	"
3383	"	27	Am.	----	s	--	--	"	"	10	"	1 25	117	" "	294	"
3384	"	28	Hol.	25	"	--	--	"	"	10	"	1 25	78	" "	342	25
3385	"	31	Swe.	9	"	--	--	"	"	10	no	1 50	156	" "	235	none
3386	"	37	"	8	m	2	2	"	pc.	10	"	1 50	26	" "	430	"
3387	"	21	Am.	----	s	--	--	"	"	10	"	1 25	none	----	391	"
3388	"	21	"	----	"	--	--	"	"	10	"	1 25	6	Pleasure	384	15
3389	"	62	"	----	m	2	..	"	day	10	"	1 25	none	----	391	50
3390	"	27	Hol.	9	"	2	1	"	pc.	10	"	1 25	26	Lack of work	359	none
3391	"	43	Am.	----	"	2	2	"	"	10	"	1 50	12	Pleasure	452	50
3392	"	39	Hol.	3	"	2	4	"	"	10	"	1 60	130	Sickness	298	none
3393	"	26	Am.	----	s	--	--	"	"	10	yes	1 25	65	Lack of work	349	"
3394	"	32	Swe.	14	m	2	4	"	"	10	"	1 50	52	Sickness*	438	"
3395	"	40	Hol.	15	"	2	6	"	"	10	"	1 25	60	" *	355	"
3396	"	26	"	2	s	--	--	"	"	10	"	1 25	234	Lack of work	137	20
3397	"	25	Am.	----	"	--	--	"	"	10	"	1 60	60	" "	454	50
3398	"	24	"	----	"	--	--	"	"	10	"	1 50	10	" "	501	125
3399	"	32	"	----	m	2	--	"	"	10	"	1 40	130	" "	300	none
3400	"	21	Hol.	18	s	--	--	"	"	10	"	1 25	39	" "	381	"

* And lack of work.
† And pleasure.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	yes	no	mort.	$250	6	yes	yes	----	no	no	None ----	----	----	----	----	yes	yes	3351
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	3352
"	no	----	----	----	----	----	----	$6 00	yes	"	" ----	----	----	----	----	"	"	3353
"	----	----	----	----	----	----	----	----	no	"	" ----	----	----	----	----	"	"	3354
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	3355
"	yes	no	mort.	150	6	yes	yes	----	"	"	" ----	----	----	----	----	"	"	3356
"	no	----	----	----	----	----	----	6 50	yes	yes	Iron Moulders U.	yes	yes	yes	yes	"	"	3357
"	"	----	----	----	----	----	----	4 00	no	no	Gravel Roofers U.	"	"	"	"	"	"	3358
"	----	----	----	----	----	----	----	----	"	"	None ----	----	----	----	----	"	"	3359
"	----	----	----	----	----	----	----	----	yes	"	" ----	----	----	----	----	"	"	3360
"	yes	no	mort.	208	6	yes	yes	----	"	"	" ----	----	----	----	----	"	"	3361
"	----	----	----	----	----	----	----	----	----	----	" ----	----	----	----	----	"	"	3362
"	----	----	----	----	----	----	----	----	no	no	" ----	----	----	----	----	"	"	3363
"	no	----	----	----	----	----	----	7 00	yes	"	" ----	----	----	----	----	"	"	3364
"	----	----	----	----	----	----	----	----	no	"	" ----	----	----	----	----	"	"	3365
"	no	----	----	----	----	----	----	6 50	yes	"	" ----	----	----	----	----	"	"	3366
"	----	----	----	----	----	----	----	----	no	"	" ----	----	----	----	----	"	"	3367
"	----	----	----	----	----	----	----	----	----	----	* ----	no	yes	no	no	"	"	3368
"	no	----	----	----	----	----	----	5 00	yes	no	* ----	"	"	"	"	"	"	3369
"	yes	no	----	----	----	yes	yes	----	"	"	* ----	"	"	"	"	"	"	3370
"	no	----	----	----	----	----	----	----	"	"	None ----	----	----	----	----	"	"	3371
"	"	----	----	----	----	----	----	6 00	no	"	* ----	no	yes	no	no	"	"	3372
"	----	----	----	----	----	----	----	----	yes	"	* ----	"	"	"	"	"	"	3373
"	yes	no	----	----	----	yes	yes	----	----	----	* ----	"	"	"	"	"	"	3374
"	"	"	----	----	----	"	"	----	yes	no	* ----	"	"	"	"	"	"	3375
"	"	"	cont.	400	7	"	"	----	"	yes	Iron Moulders U.	yes	"	yes	yes	"	"	3376
"	"	yes	----	----	----	----	"	----	no	"	None ----	----	----	----	----	"	"	3377
"	no	----	----	----	----	----	----	8 50	"	"	" ----	----	----	----	----	"	"	3378
"	"	----	----	----	----	----	----	7 00	yes	no	" ----	----	----	----	----	"	"	3379
"	----	----	----	----	----	----	----	----	----	----	" ----	----	----	----	----	"	"	3380
s-mo.	yes	yes	----	----	----	----	yes	----	yes	no	" ----	----	----	----	----	no	no	3381
"	"	no	mort.	500	7	yes	"	----	"	"	" ----	----	----	----	----	yes	yes	3382
"	----	----	----	----	----	----	----	----	no	"	" ----	----	----	----	----	"	"	3383
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	3384
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	3385
"	yes	yes	----	----	----	----	no	----	"	"	" ----	----	----	----	----	"	"	3386
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	3387
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	3388
"	no	----	----	----	----	----	----	4 00	"	"	" ----	----	----	----	----	"	"	3389
"	"	----	----	----	----	----	----	3 00	"	"	" ----	----	----	----	----	"	"	3390
"	"	----	----	----	----	----	----	4 00	yes	"	" ----	----	----	----	----	"	"	3391
"	"	----	----	----	----	----	----	3 00	no	"	" ----	----	----	----	----	no	"	3392
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	yes	"	3393
"	yes	no	mort.	725	7	yes	yes	----	yes	"	" ----	----	----	----	----	"	"	3394
"	no	----	----	----	----	----	----	5 00	no	"	" ----	----	----	----	----	"	"	3395
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	3396
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	3397
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	3398
"	no	----	----	----	----	----	----	8 00	"	"	" ----	----	----	----	----	"	"	3399
"	----	----	----	----	----	----	----	----	"	"	" ----	----	----	----	----	"	"	3400

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* Donaldson Bros. Employés Sick and Accident Benefit Association.

Book No. 69. **Table No. 1.—CONTINUED.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3401	G'd Rapids.	34	Am.	----	m	2	2	Filer	pc.	10	yes	$1 25	52	Lack of work	$365	none
3402	"	35	"	----	"	2	4	"	"	10	"	1 25	156	" "	235	"
3403	"	53	Hol.	15	"	2	7	"	"	10	"	1 25	26	" "	398	"
3404	"	42	Pol.	3	"	2	2	"	day	10	....	1 25	113	" "	250	"
3405	"	42	Can.	16	"	2	3	"	pc.	10	no	1 25	156	" "	196	"
3406	"	37	Ger.	10	"	2	3	"	"	10	"	1 25	8	" "	381	"
3407	"	28	"	12	s	..	..	"	day	10	"	1 25	52	" "	326	"
3408	"	42	Am.	----	m	2	3	"	"	10	"	1 10	52	" "	287	"
3409	"	43	Can.	----	"	2	2	"	"	10	"	3 00	none	....	939	"
3410	"	45	Ger.	13	"	2	6	"	"	10	"	1 25	157	Lack of work	195	"
3411	"	32	Pol.	6	"	2	2	"	"	10	"	1 25	263	" "*	66	"
3412	"	41	Ger.	12	"	2	1	"	"	10	"	1 25	104	" "	261	"
3413	"	27	Am.	----	"	2	1	"	"	10	"	1 50	104	" "	313	"
3414	"	21	Can.	16	"	2	..	"	"	10	yes	1 50	18	" "	442	$100
3415	"	44	"	3	"	2	3	"	"	10	"	1 50	104	" "	313	none
3416	"	25	Pol.	10	"	2	1	"	"	10	"	1 50	182	" "	197	"
3417	"	32	Swe.	8	"	2	1	"	"	10	"	1 50	52	" "	391	"
3418	"	26	Am.	----	s	..	..	"	"	10	"	1 50	none	....	470	125
3419	"	35	Nor.	10	m	2	3	"	"	10	"	1 50	"	....	470	none
3420	"	26	Am.	----	"	2	1	"	"	10	no	1 25	104	Lack of work	261	"
3421	"	34	Can.	5	"	2	1	"	"	10	yes	1 75	156	" "	275	"
3422	"	42	Hol.	30	"	2	3	"	"	10	"	1 25	78	" "	305	"
3423	"	33	Irish	16	"	2	1	"	"	10	"	1 50	none	....	483	"
3424	"	25	Am.	----	"	2	--	"	"	10	"	1 50	52	Sickness......	405	"
3425	"	42	Hol.	3	"	2	--	"	"	10	"	1 00	60	Lack of work	264	"
3426	"	24	Am.	----	s	..	--	"	"	10	"	1 25	156	Sickness......	210	"
3427	"	34	"	----	m	2	2	"	"	10	"	1 00	78	Lack of work	246	"
3428	"	42	Ger.	16	"	2	6	"	"	10	"	1 25	52	" "	340	"
3429	"	28	Am.	----	s	..	--	"	"	10	"	1 00	78	" "	245	"
3430	"	29	Hol.	17	m	2	4	"	"	10	"	1 50	78	" "*	352	"
3431	"	28	"	15	s	..	--	"	"	10	"	1 00	104	" "	209	"
3432	"	26	Am.	----	"	--	--	"	"	10	"	1 00	72	" "	241	"
3433	"	29	Ger.	8	"	..	--	"	"	10	"	1 00	84	" "	229	"
3434	"	38	"	28	m	2	3	"	"	10	"	1 50	none	....	485	"
3435	"	43	"	8	"	2	6	"	"	10	no	1 00	3	Sickness......	310	"
3436	"	20	Am.	----	s	--	--	"	"	10	"	1 50	156	Lack of work	236	"
3437	Marshall...	22	Ger.	----	"	..	--	"	"	10	....	1 00	40	" "	273	"
3438	" ...	30	"	----	m	2	--	"	"	10	no	1 25	40	" "	341	"
3439	" ...	21	Am.	----	s	.	--	"	"	10	yes	1 00	30	" "	283	"
3440	" ...	21	"	----	"	..	--	"	"	10	no	1 25	40	" "	341	"
3441	" ...	38	"	----	m	2	6	"	"	10	yes	1 25	50	" "	328	"
3442	" ...	30	Nor.	----	"	2	2	"	"	10	no	2 25	50	" "	591	"
3443	" ...	39	"	----	s	..	--	"	"	10	yes	1 25	30	" "	354	"
3444	" ...	22	"	----	m	2	..	"	"	10	"	1 00	138	" "	175	"
3445	" ...	27	Irish	----	"	2	1	"	"	10	"	1 00	240	" "	73	"
3446	" ...	24	Am.	----	s	..	--	"	"	10	"	1 00	10	Sickness......	301	"
3447	" ...	44	"	----	m	2	..	"	"	10	"	1 75	60	Lack of work	442	"
3448	" ...	40	Scot.	25	"	2	11	"	"	10	"	1 25	49	" "	341	"
3449	" ...	51	Am.	----	"	2	1	"	"	10	"	1 00	200	Sickness	113	......
3450	" ...	46	Ger.	41	w	1	1	"	"	10	"	1 00	50	Lack of work	263	none

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo	no							$5 00	yes	no	None					yes	yes	3401
"	"							7 00	"	"	B. & M. I. Un.	yes	no	yes	yes	"	"	3402
"	yes	no	cont.	$500	7	yes	yes		no	"	None					"	"	3403
wk.	no							5 00	yes	"	"					"	"	3404
"	"							5 00	no	"	B. of B. M.	no	no	no	yes	"	"	3405
"	yes	no	mort.	300	7	yes	yes		yes	"	B. & M. I. Un.	yes	yes	yes	"	"	"	3406
"	no								"	"	None					"	"	3407
"	yes	yes					yes		"	"	"					"	"	3408
"	"	no	cont.	650	7	yes	no		"	"	"					"	"	3409
"	"	"	mort.	200	8	"	yes		no	"	"					"	"	3410
"	no							4 00	yes	"	"					no	no	3411
"	yes	no	mort.	300	7	yes	yes		no	"	"					yes	yes	3412
"	no							6 00	"	"	B. of B. M.	no	no	no	yes	"	"	3413
"	"							8 00	"	"	None					"	"	3414
"	"							5 50	"	"	Iron Moulders' Un.	yes	yes	yes	yes	"	"	3415
"	"							4 00	"	yes	B. of B. M.				"	"	"	3416
"	"							6 00	"	"	None					no	no	3417
"									"	no	Cabinet Makers' Un.	yes	yes	yes	yes	yes	yes	3418
"	yes	no	mort.	600	6	yes	yes		yes	yes	None					"	"	3419
"	no							3 00	no	no	*	no	yes	no	yes	"	"	3420
"	"							6 00	"	"	B. of B. M.	"	no	"	"	"	"	3421
"	"								"	"	None					"	"	3422
"	"							8 00	yes	yes	Iron Moulders' Un.	yes	yes	yes	yes	yes	yes	3423
"	"							6 00	"	no	None					"	"	3424
"	"							3 00	no	"	"					"	"	3425
"									"	"	"					"	"	3426
"	no							6 50	yes	"	"					"	"	3427
"	yes	no	mort.	400	7	yes	yes		"	"	"					"	"	3428
"									no	"	"					"	"	3429
"	no							5 00	"	"	B. of B. M.	no	no	no	yes	"	"	3430
"									"	"	None					"	"	3431
"									"	"	"					"	"	3432
"									"	"	"					"	"	3433
"	no							6 00	"	"	"					no	no	3434
"	yes	no	mort.	200	7	yes	yes		yes	yes	"					yes	yes	3435
"									no	"	B. of B. M.	no	no	no	yes	"	"	3436
s-mo.									"	no	None					"	no	3437
"	yes	yes					yes		"	"	"					"	yes	3438
"									"	"	"					no	no	3439
"									"	"	"					yes	yes	3440
"	yes	yes					yes		"	"	"					"	"	3441
"	no							5 00	"	"	"					"	"	3442
"	"							10 00	"	"	"					"	"	3443
"	"										"					"		3444
"	"								yes	no	"					"	yes	3445
"	yes	no	mort.	200	7	yes	yes				"					"	"	3446
"	"	yes					"		yes	no	"					"	no	3447
"	"	"					"		no	"	"					"	yes	3448
"	no							7 00	"	"	"					"		3449
"	yes	yes					yes		"	"	"					no	no	3450

* Plumbers' Gas and Steam Fitters' and Steam Fitters' Helpers' Union.

Book No. 70. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3451	Marshall	53	Ger.	41	m	2	2	Filer	day	10	yes	$1 00	none		$313	none
3452	"	30	Am.	----	"	2	5	"	"	10	"	1 25	52	Sickness	326	"
3453	"	26	Ger.	----	s	--	--	"	"	10	"	1 25	60		316	
3454	"	35	Eng.	----	m	2	1	"	"	10	"	1 25	134	Sickness	168	none
3455	"	18	Am.	----	s	--	--	"	"	10	"	1 25	130	Lack of work	228	
3456	"	21	Ger.	----	"	--	--	"	"	10	"	1 00	182	Sickness	131	none
3457	Detroit	26	Can.	2	m	2	--	"	"	10	no	1 50	160	Lack of work	230	"
3458	"	24	"	----	s	--	--	"	"	10	"	1 50	6	Pleasure	460	"
3459	"	26	Belg.	3	"	--	--	"	"	10	"	1 50	35	Lack of work	417	$150
3460	"	25	Am.	----	m	2	1	"	"	10	"	3 20	4	Pleasure	989	400
3461	"	21	"	----	s	--	--	"	"	10	"	1 50	50	Lack of work	395	40
3462	"	21	Can.	3	"	--	--	"	"	10	"	1 50	26	Sickness	430	60
3463	"	24	Am.	----	"	--	--	"	"	10	"	1 50	25	Lack of work	432	70
3464	"	32	Irish	8	"	--	--	"	"	10	"	1 50	182	" "	196	none
3465	"	23	Am.	----	"	--	--	"	"	10	"	1 50	208	Sickness*	157	"
3466	"	29	"	----	m	2	--	"	"	10	"	1 50	104	Lack of work	313	"
3467	Bay City	26	"	----	"	2	1	"	"	10	"	1 50	13	Sickness	450	"
3468	"	24	Can.	16	s	--	--	"	"	10	"	1 25	78	Lack of work	294	"
3469	"	19	Am.	----	"	--	--	"	"	10	"	1 25	30	" "	354	25
3470	"	58	"	----	m	3	--	"	pc	10	"	2 00	5	Sickness	616	200
3471	"	49	"	----	"	2	5	"	"	10	"	1 25	10	"	379	none
3472	"	28	Scot.	----	s	--	--	"	"	10	"	2 00	40	Lack of work	546	"
3473	W. Bay City	44	Am.	----	m	2	--	"	"	10	"	1 50	18	Sickness	443	375
3474	" "	45	Ger.	26	"	2	1	"	"	10	"	1 50	60	Lack of work	380	75
3475	" "	33	Am.	----	"	2	1	"	"	10	"	2 00	60	Vacation*	506	none
3476	Jackson	21	"	----	s	2	2	"	"	10	"	1 25	130	Lack of work	229	"
3477	Lowell	25	"	----	m	2	1	Benchman	"	10	"	50	160	" "	76	"
3478	"	63	"	----	"	2	1	"	"	10	"	1 75	100	" "	373	"
3479	"	37	"	----	"	2	3	"	"	10	"	1 75	156	" "	275	"
3480	"	19	Ger.	----	s	--	--	"	"	10	"	1 92	90	" "	428	"
3481	"	52	Scot.	40	m	2	--	"	"	10	"	1 75	156	" "	275	"
3482	"	42	Am.	----	"	2	1	"	"	10	"	1 75	60	" "	442	100
3483	"	41	"	----	"	2	4	"	"	10	"	1 25	120	" "	241	none
3484	"	47	"	----	"	2	3	"	"	10	"	1 75	156	" "	275	
3485	"	32	"	----	"	3	2	"	"	10	"	1 25	156	" "	196	none
3486	Jackson	24	"	----	s	--	--	"	day	10	yes	1 50	60		400	"
3487	"	20	"	----	"	--	--	"	"	10	"	1 25	50	Lack of work	329	
3488	"	21	"	----	"	--	--	"	"	10	"	1 25	15	Sickness	373	40
3489	Lansing	42	Can.	32	m	2	1	"	"	10	no	1 25	6	Pleasure	384	none
3490	"	62	Eng.	----	"	2	--	"	"	10	"	1 25	20	Sickness	366	25
3491	"	37	Am.	----	"	2	1	"	"	10	"	1 50	10	"	455	none
3492	Kalamazoo	56	"	----	"	2	4	"	pc.	10	"	1 50	10	Lack of work	455	65
3493	"	35	"	----	w	1	3	"	"	10	"	1 75	10	" "	530	10
3494	"	60	"	----	m	3	1	"	"	10	"	1 50	10	" "	452	none
3495	Battle Creek	21	"	----	s	--	--	"	day	10	yes	1 28	10	" "	410	50
3496	" "	28	"	----	m	2	2	"	"	10	"	1 61	30	Vacation*	500	none
3497	Charlotte	38	"	----	"	2	2	"	"	10	"	1 09	60	Lack of work	275	"
3498	"	33	"	----	s		--	"	pc.	10	no	60	100	" "	127	10
3499	Ionia	48	"	----	m	2	1	"	day	10	"	1 25	100	" "	265	none
3500	"	47	"	----	"	2	2	"	"	10	"	1 60	78	" "	376	"

* And lack of work.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.	no	----	----	----	----	----	----	$6 00	yes	yes	None	----	----	----	----	yes	..	3451
"	"	----	----	----	----	----	----	4 00	----	no	"	----	----	----	----	no	no	3452
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	----	yes	3453
"	no	----	----	----	----	----	----	7 00	yes	no	"	----	----	----	----	----	no	3454
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	----	----	3455
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	yes	yes	3456
wk.	no	----	----	----	----	----	----	8 00	no	no	"	----	----	----	----	no	----	3457
"	----	----	----	----	----	----	----	----	yes	----	"	----	----	----	----	yes	----	3458
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	no	----	3459
"	no	----	----	----	----	----	----	12 00	----	----	"	----	----	----	----	yes	----	3460
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	3461
"	----	----	----	----	----	----	----	----	yes	yes	"	----	----	----	----	"	----	3462
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	3463
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	3464
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	no	----	3465
"	no	----	----	----	----	----	----	6 00	----	----	"	----	----	----	----	yes	----	3466
"	"	----	----	----	----	----	----	8 00	yes	no	"	----	----	----	----	"	yes	3467
"	"	----	----	----	----	----	--	6 00	no	yes	"	----	----	----	----	"	"	3468
"	----	----	----	----	----	----	----	----	"	no	"	----	----	----	----	"	"	3469
"	yes	no	mort.	$50	8	yes	yes	----	yes	"	"	----	----	----	----	"	"	3470
"	no	----	----	----	----	----	----	4 00	no	"	"	----	----	----	----	"	"	3471
"	----	----	----	----	----	----	----	----	"	"	B. of B. M.	no	no	no	yes	"	"	3472
"	yes	no	cont.	250	7	yes	yes	----	"	"	None	----	----	----	----	"	"	3473
"	no	----	----	----	----	----	----	8 00	yes	"	"	----	----	----	----	"	"	3474
"	"	----	----	----	----	----	----	6 00	no	"	"	----	----	----	----	"	"	3475
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3476
mo.	no	----	----	----	----	----	----	3 50	"	"	"	----	----	----	----	"	"	3477
"	yes	yes	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3478
"	no	----	----	----	----	----	----	8 00	yes	"	"	----	----	----	----	"	"	3479
wk.	----	----	----	----	----	----	----	----	no	"	"	--	----	----	----	"	"	3480
mo.	yes	yes	----	----	----	----	yes	----	"	"	"	----	----	----	----	"	no	3481
"	no	----	----	----	----	----	----	7 00	yes	yes	K. of L.	no	no	yes	yes	"	"	3482
"	yes	----	----	----	----	----	----	----	no	no	None	----	----	----	----	"	yes	3483
"	no	----	----	----	----	----	----	7 00	"	"	"	--	----	----	----	"	"	3484
wk.	yes	yes	----	----	----	----	yes	----	yes	"	"	--	----	----	----	"	----	3485
s-mo.	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	yes	3486
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	no	no	3487
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	yes	3488
wk.	yes	yes	----	----	----	----	yes	----	"	"	"	----	----	----	----	yes	"	3489
"	"	no	mort.	200	7	yes	"	----	"	"	"	----	----	----	----	"	"	3490
"	no	----	----	----	----	----	----	6 00	yes	"	M. Woodw'k'. U'n	yes	yes	yes	yes	"	"	3491
"	yes	no	mort.	100	7	yes	yes	----	"	"	None	----	----	----	----	"	"	3492
"	no	----	----	----	----	----	----	7 00	"	"	"	----	----	----	----	"	"	3493
"	yes	yes	----	----	----	----	no	----	"	"	"	----	----	----	----	"	"	3494
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	3495
"	no	----	----	----	----	----	----	10 00	"	"	"	----	----	----	----	"	"	3496
"	yes	yes	----	----	----	----	yes	----	"	"	"	----	----	----	----	"	"	3497
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	no	3498
s-mo.	yes	yes	----	----	----	----	yes	----	"	"	"	----	----	----	----	"	yes	3499
"	"	no	mort.	375	7	yes	"	----	yes	"	"	----	----	----	----	"	----	3500

Book No. 71. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3501	Flint	29	Am.	----	m	2	1	Benchman	pc.	10	yes	$1 50	60	Lack of work	$380	none
3502	G'd Rapids.	34	Dane	18	“	2	1	“	day	10	no	1 50	260	“ “	80	“
3503	Marshall	16	Am.	----	s	--	--	“	“	10	“	50	100	“ “	107	“
3504	Pontiac	54	“	----	m	7	5	“	“	10	----	1 50	none	----	470	“
3505	Charlotte	47	“	----	“	2	--	Seat maker.	pc.	10	no	1 50	90	Lack of work*	335	“
3506	Coldwater	33	“	----	“	2	1	“ “	day	10	yes	1 00	30	“ “	283	“
3507	Detroit	31	“	----	“	2	4	“ “	pc.	10	no	1 60	90	Sickness	357	“
3508	Wayne	21	“	----	s	--	--	“ “	day	10	yes	1 25	30	Lack of work	344	----
3509	G'd Rapids.	56	Can.	23	m	2	3	Leather w'k'r	wk.	10	no	1 33	none	----	416	none
3510	“	20	Am.	----	s	--	--	“ “	“	10	“	66	12	Lack of work	198	“
3511	“	17	“	----	“	--	--	Wheel lacer.	day	10	yes	85	52	“ “	255	“
3512	“	18	“	----	“	--	--	“ “	“	10	“	1 00	12	“ “*	340	“
3513	“	24	“	----	“	--	--	“ “	pc.	10	“	2 50	12	Pleasure*	830	“
3514	Jackson	35	Ger.	----	“	--	--	Stitcher	day	10	no	1 25	60	Lack of work	316	“
3515	“	18	Fr.	----	“	--	--	“	“	10	“	1 25	50	Sickness	330	----
3516	“	18	Ger.	----	“	--	--	“	“	10	“	83	none	----	280	none
3517	“	21	“	----	“	--	--	“	“	10	“	1 00	30	Pleasure	283	“
3518	“	24	“	----	“	--	--	“	“	10	“	1 00	6	Lack of work	307	$50
3519	“	35	Am.	----	“	3	--	“	“	10	“	85	30	“ “*	240	none
3520	“	24	“	----	m	2	--	“	“	10	“	1 25	none	----	391	“
3521	“	19	Ger.	----	s	--	--	“	“	10	“	83	“	----	261	“
3522	Kalamazoo	22	Am.	----	“	--	--	“	“	10	“	1 25	“	----	391	75
3523	“	20	“	----	“	--	--	“	“	10	“	1 00	50	Lack of work	263	50
3524	“	24	“	----	“	--	--	“	“	10	“	1 00	10	“ “	303	60
3525	“	22	“	----	“	--	--	“	“	10	“	1 00	none	----	313	100
3526	“	22	“	----	“	--	--	“	“	10	“	1 00	“	----	313	75
3527	Three Rivers.	30	“	----	“	--	--	“	“	10	“	85	“	----	266	----
3528	“ “	43	“	----	w	1	2	“	“	10	“	90	30	Sickness	255	none
3529	“ “	20	“	----	s	--	--	“	“	10	“	75	none	----	235	“
3530	“ “	22	“	----	“	--	--	“	“	10	“	75	60	Lack of work	190	“
3531	“ “	22	“	----	“	--	--	“	“	10	“	85	none	----	266	----
3532	“ “	25	“	----	“	--	--	“	“	10	“	85	“	----	266	----
3533	Wayne	20	“	----	“	--	--	“	“	10	yes	72	15	Lack of work	215	none
3534	“	16	“	----	“	--	--	“	“	10	no	50	30	“ “	142	“
3535	Owosso	28	“	----	m	2	1	“	“	10	“	1 00	125	“ “	188	“
3536	Pontiac	23	“	----	s	--	--	“	wk.	9	“	50	213	Other work	50	“
3537	Charlotte	16	“	----	“	--	--	Paster	day	10	“	50	60	Lack of work	127	12
3538	Three Rivers.	40	“	----	w	1	4	“	“	8	“	90	261	Other work*	47	none
3539	G'd Rapids.	27	“	----	m	2	2	Polisher	pc.	10	yes	2 75	52	Lack of work	803	“
3540	“	24	“	----	“	2	2	“	“	10	“	2 75	12	Sickness	913	100
3541	“	24	“	----	s	--	--	“	“	10	“	2 75	52	Lack of work*	803	50
3542	“	28	“	----	“	--	--	“	day	10	“	3 00	none	----	1,036	300
3543	“	28	Ger.	25	m	2	1	“	pc.	10	no	2 50	156	Lack of work	392	none
3544	“	30	Pol.	18	“	2	3	“	“	10	“	2 50	52	“ “	653	“
3545	“	54	Am.	----	“	2	5	“	“	10	“	2 50	156	“ “	393	“
3546	“	19	“	----	s	--	--	“	“	10	“	2 50	78	“ “	588	“
3547	“	21	Hol.	14	“	--	--	“	day	10	“	2 25	12	Pleasure	677	200
3548	“	20	Am.	----	“	--	--	“	pc.	10	“	2 50	26	Lack of work	717	none
3549	“	25	Hol.	8	“	--	--	“	“	10	yes	2 25	52	“ “	657	200
3550	“	30	Am.	----	m	2	1	“	“	10	“	2 75	30	“ “	864	300

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.	no							$5 00	yes	yes	None					yes	no	3501
"	"							6 00	"	no	"					"	yes	3502
"									no	"	"					"	"	3503
wk.	yes	no	cont.	$425	6	yes	yes		"	"	"					"	"	3504
"	"	yes					"		yes	"	"					"	no	3505
"	no							5 00	no	"	"					"	yes	3506
"	"							7 00	yes	"	"					"	"	3507
"											"					"	"	3508
"	yes	no	mort.	1,100	7	yes	yes		yes	no	"					"	"	3509
"									no	"	"					"	no	3510
s-mo									"	"	"					"	yes	3511
"									yes	"	"					"	"	3512
"									no	"	B. of B. M.	no	no	no	no	"	"	3513
s-wk.											None					"	no	3514
s-mo.											"					"	"	3515
wk.									no	no	"					no	yes	3516
"									"	"	"					yes	"	3517
"	no							6 00	"	"	"					no	"	3518
"	yes	yes							"	"	"					yes	"	3519
"	no							10 00	"	"	"					"	"	3520
"									"	"	"					"	"	3521
s-mo.											"					no	no	3522
"											"					"	"	3523
"											"					"	"	3524
"											"					"	"	3525
wk.											"					"	"	3526
"											"					yes	"	3527
"	yes	yes					yes				"					"	yes	3528
"									no	no	"					"	no	3529
"											"					"	yes	3530
"									yes		"					"		3531
"									"		"							3532
"											"					yes	yes	3533
s-mo.											"					"	"	3534
wk.	no							10 00	yes	no	"					"	"	3535
"									no	"	"					"	"	3536
"									"	"	"					"	"	3537
"	no							4 00			"					"		3538
s-mo.	"							6 00	no	no	Metal Pol. Union	no	no	yes	yes	"	yes	3539
"	"							5 00	"	"	" " "	"	"	"	"	"	"	3540
"											" " "	"	"	"	"	"	"	3541
"									yes	yes	" " "	"	"	"	"	"	"	3542
"	no							6 00	no	no	" " "	"	"	"	"	"	"	3543
"	yes	no	cont.	800	7	yes	yes		yes	"	" " "	"	"	"	"	"	"	3544
"	no							6 00	"	"	" " "	"	"	"	"	"	"	3545
"									no	"	" " "	"	"	"	"	"	"	3546
"									"	"	" " "	"	"	"	"	"	"	3547
"									"	"	" " "	"	"	"	"	"	"	3548
"									"	"	B. of B. M.	"	"	no	"	"	"	3549
"	no							7 00	"	"	Metal Pol. Union	"	"	yes	"	"	"	3550

Book No. 72. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3551	G'd Rapids.	35	Ger.	13	m	2	3	Polisher....	day	10	no	$2 25	78	Sickness*....	$529	none
3552	"	34	Am.	----	"	2	--	" ----	pc.	10	yes	2 50	24	Pleasure*....	800	"
3553	"	24	"	----	"	2	1	" ----	day	10	"	2 50	104	Lack of work	560	"
3554	"	23	Can.	----	s	--	--	" ----	pc.	10	"	2 75	none	----------------	946	$100
3555	"	23	Am.	----	"	--	--	" ----	"	10	"	2 50	12	Lack of work	830	none
3556	"	28	"	----	"	--	--	" ----	"	10	"	2 50	24	" "	800	350
3557	"	19	Ger.	17	"	--	--	" ----	"	10	"	2 50	52	" "	730	none
3558	"	24	Am.	----	m	2	2	" ----	"	10	"	2 50	8	" "	840	50
3559	"	23	"	----	s	--	--	" ----	"	10	"	2 50	104	" "	600	300
3560	"	24	"	----	"	--	--	" ----	"	10	"	2 25	78	Pleasure.....	617	150
3561	"	24	"	----	m	2	--	" ----	"	10	no	2 75	none	------ ---------	861	none
3562	"	19	"	----	s	--	--	" ----	"	10	yes	1 50	13	Sickness*....	467	"
3563	"	36	Hol.	27	m	2	5	" ----	"	10	"	2 50	15	Pleasure.....	772	100
3564	"	21	Am.	----	s	--	--	" ----	"	10	"	1 75	60	Lack of work	462	none
3565	"	33	"	----	"	--	--	" ----	"	10	"	2 50	130	Sickness.....	458	"
3566	"	29	"	----	m	2	1	" ----	"	10	"	2 50	12	" -----	752	"
3567	"	29	Ger.	14	"	2	3	" ----	"	10	"	2 50	52	Lack of work	653	100
3568	"	38	"	16	"	2	3	" ----	"	10	no	1 00	156	" "	157	none
3569	"	18	Hol.	4	s	--	--	" ----	"	10	yes	1 50	26	" "	441	"
3570	"	20	Am.	----	"	--	--	" ----	"	10	"	1 50	156	" "	246	"
3571	"	20	"	----	"	--	--	" ----	"	10	"	1 25	52	" "	337	40
3572	Marshall....	50	"	----	m	3	1	" ----	"	10	"	2 00	130	" "	366	none
3573	" ----	31	"	----	"	2	2	" ----	"	10	"	1 25	40	" "	341	"
3574	" ----	21	"	----	"	2	--	" ----	"	10	"	1 25	20	" "	366	"
3575	" ----	28	"	----	"	3	2	" ----	"	10	"	2 00	12	Vacation.....	602	......
3576	" ----	24	"	----	s	--	--	" ----	"	10	"	2 00	95	Lack of work	476	75
3577	" ----	37	Eng.	----	m	2	4	" ----	"	10	"	1 25	3	----------------	387	none
3578	" ----	22	Am.	----	s	--	--	" ----	"	10	"	2 00	50	Lack of work	526	"
3579	" ----	21	"	----	m	2	--	" ----	"	10	no	1 00	50	" "	263	"
3580	" ----	21	"	----	s	--	--	" ----	"	10	yes	1 25	none	----------------	391	"
3581	" ----	30	"	----	m	2	1	" ----	"	10	no	1 00	156	Lack of work	157	"
3582	Detroit.....	20	"	----	s	--	--	" ----	"	10	"	1 50	none	----------------	470	60
3583	" -----	17	"	----	"	--	--	" ----	"	10	"	1 00	60	Sickness..	253	none
3584	" -----	24	"	----	"	--	--	" ----	"	10	"	1 50	52	Lack of work	391	75
3585	" -----	23	"	----	"	--	--	" ----	"	10	"	2 00	25	" "	576	75
3586	" -----	21	"	----	"	--	--	" ----	"	10	"	1 50	104	Sickness*....	313	......
3587	" -----	17	"	----	"	--	--	" ----	"	10	"	1 25	78	" ----	294	none
3588	" -----	24	Ger.	17	"	--	--	" ----	"	10	"	1 50	156	Lack of work	235	"
3589	" -----	17	Am.	----	"	--	--	" ----	----	10	---	66	25	" "	192	15
3590	" -----	20	"	----	"	--	--	" ----	day	10	no	1 25	52	" "	326	none
3591	Kalamazoo.	35	"	----	m	2	--	" ----	"	10	----	2 25	60	" "	569	150
3592	"	21	"	----	s	--	--	" ----	pc.	10	----	1 50	90	" "	335	none
3593	"	30	"	----	"		--	" ----	day	10	----	2 00	90	" "	446	"
3594	"	30	"	----	m	2	--	" ----	"	10	----	2 50	50	" "	658	100
3595	"	40	"	----	s		--	" ----	pc.	10	----	3 00	30	" "	849	400
3596	"	35	"	----	m	2	7	" ----	"	10	----	1 65	30	" "	467	165
3597	"	35	Ger.	21	"	2	3	" ----	"	10	---	1 50	50	" "	395	75
3598	"	23	Am.	----	s	--	--	" ----	"	10	----	2 00	30	" "	566	125
3599	"	30	"	----	m	2	--	" ----	"	10	---	2 00	30	" "	566	210
3600	Jackson....	2	"	----	s		--	" ----	"	10	yes	2 00	60	Sickness*....	506	none

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* And lack of work.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.	no	----	----	----	----	----	----	$8 00	yes	no	Metal Pol. Union	no	no	yes	yes	yes	yes	3551
"	"	----	----	----	----	----	----	7 00	"	"	" " "	"	"	"	"	"	"	3552
wk.	"	----	----	----	----	----	----	8 00	"	"	" " "	"	"	"	"	"	"	3553
s-mo.	----	----	----	----	----	----	----	----	"	"	" " "	"	"	"	"	"	"	3554
"	----	----	----	----	----	----	----	----	no	"	" " "	"	"	"	"	"	"	3555
"	----	----	----	----	----	----	----	----	yes	"	" " "	"	"	"	"	"	"	3556
"	----	----	----	----	----	----	----	----	no	"	" " "	"	"	"	"	"	"	3557
"	no	----	----	----	----	----	----	6 00	yes	"	" " "	"	"	"	"	"	"	3558
"	----	----	----	----	----	----	----	----	no	"	" " "	"	"	"	"	"	"	3559
"	----	----	----	----	----	----	----	----	yes	"	" " "	"	"	"	"	"	"	3560
wk.	no	----	----	----	----	----	----	----	no	"	" " "	"	"	"	"	"	"	3561
"	----	----	----	----	----	----	----	----	"	"	None	----	----	----	----	"	"	3562
"	yes	no	mort.	$800	7	yes	yes	----	"	"	"	----	----	----	----	----	no	3563
"	----	----	----	----	----	----	----	----	yes	yes	Metal Pol. Union	no	no	yes	yes	yes	yes	3564
"	----	----	----	----	----	----	----	----	"	no	" " "	"	"	"	"	"	"	3565
"	no	----	----	----	----	----	----	6 00	"	"	" " "	"	"	"	"	"	"	3566
"	yes	no	cont.	600	7	yes	yes	----	"	"	" " "	"	"	"	"	"	"	3567
"	"	yes	----	----	----	----	"	----	"	yes	None	----	----	----	----	"	"	3568
"	----	----	----	----	----	----	----	----	no	"	Metal Pol. Union	no	no	yes	yes	"	no	3569
"	----	----	----	----	----	----	----	----	"	"	None	----	----	----	----	"	yes	3570
"	----	----	----	----	----	----	----	----	"	"	Metal Pol. Union	no	no	yes	yes	"	"	3571
s-mo.	no	----	----	----	----	----	----	7 00	ye-	"	None	----	----	----	----	"	"	3572
"	"	----	----	----	----	----	----	5 50	no	no	"	----	----	----	----	"	"	3573
"	"	----	----	----	----	----	----	7 00	----	----	"	----	----	----	----	"	"	3574
"	"	----	----	----	----	----	----	7 00	yes	no	"	----	----	----	----	"	no	3575
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	yes	3576
"	no	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	3577
"	----	----	----	----	----	----	----	----	yes	no	"	----	----	----	----	"	yes	3578
"	no	----	----	----	----	----	----	5 00	"	"	"	----	----	----	----	"	"	3579
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3580
"	no	----	----	----	----	----	----	5 00	"	"	"	----	----	----	----	"	"	3581
wk.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	3582
----	yes	yes	----	----	----	----	yes	----	----	----	"	----	----	----	----	"	----	3583
wk.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	3584
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	3585
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	3586
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	3587
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	3588
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	3589
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	3590
"	yes	yes	----	----	----	----	yes	----	----	----	"	----	----	----	----	"	yes	3591
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	3592
"	----	----	----	----	----	----	----	----	----	----	Wheelm'k's Union	----	----	----	----	"	"	3593
"	yes	yes	----	----	----	----	yes	----	yes	----	None	----	----	----	----	"	"	3594
"	----	----	----	----	----	----	----	----	no	----	"	----	----	----	----	"	"	3595
"	yes	yes	----	----	----	----	yes	----	yes	----	Wheelm'k's Union	----	----	----	----	"	"	3596
"	"	no	mort.	100	7	yes	"	----	----	----	" "	----	----	----	----	no	no	3597
"	----	----	----	----	----	----	----	----	----	----	" "	----	----	----	----	yes	yes	3598
"	yes	yes	----	----	----	----	yes	----	yes	----	None	----	----	----	----	"	"	3599
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	3600

Book No. 73. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3601	Jackson ----	20	Am.	----	s	--	--	Polisher ----	pc.	10	no	$1 40	100	Lack of work	$298	none
3602	" ----	18	"	----	"	--	--	" ----	"	10	yes	1 75	30	" "	495	"
3603	" ----	36	"	----	m	2	1	" ----	"	10	"	1 75	50	" "	460	$50
3604	" ----	21	Irish	16	s	--	--	" ----	"	10	"	1 75	50	" "	460	none
3605	" ----	20	Fr.	----	"	--	--	" ----	"	10	no	1 50	50	" "*	400	"
3606	" ----	21	Ger.	16	"	--	--	" ----	day	10	yes	1 00	60	" "	253	"
3607	" ----	19	Am.	----	"	--	--	" ----	"	10	"	1 25	60	" "	316	"
3608	Bay City ---	18	"	----	"	--	--	" ----	"	10	no	1 50	10	" "	455	100
3609	" " ---	36	"	----	m	2	--	" ----	"	10	yes	3 00	20	" "	879	200
3610	" " ---	25	"	----	s	--	--	" ----	"	10	"	1 25	30	Sickness -----	354	none
3611	" " ---	21	"	----	"	--	--	" ----	"	10	no	1 25	30	Lack of work	354	65
3612	" " ---	35	"	----	m	2	4	" ----	"	10	"	1 00	5	Sickness ----	308	none
3613	G'd Rapids	18	"	----	s	--	--	Reed worker	pc.	10	"	1 00	182	Lack of work	131	"
3614	"	63	Scot.	30	m	2	--	" "	day	10	"	1 35	104	" "	282	"
3615	"	28	Can.	10	"	2	1	" "	pc.	10	"	1 70	104	" "	355	"
3616	"	41	Am	----	s	--	--	" "	day	10	"	75	78	" "	176	"
3617	"	19	Can.	5	"	--	--	" "	pc.	10	"	80	104	" "	164	"
3618	"	27	Eng.	4	"	--	--	" "	"	10	"	90	78	" "	212	"
3619	"	29	"	8	"	--	--	" "	"	10	"	2 50	78	" "	587	"
3620	"	21	Pol.	----	"	--	--	" "	day	10	"	1 83	156	" "	287	"
3621	"	23	Am.	----	m	2	--	" "	"	10	"	1 75	104	" "	366	"
3622	"	47	Hol.	10	"	2	10	" "	"	10	"	1 70	52	" "	444	"
3623	"	22	"	8	s	--	--	" "	pc.	10	"	80	156	" "	126	"
3624	"	23	Am.	----	"	--	--	" "	"	10	"	80	108	" "	164	"
3625	"	20	Pol.	10	"	--	--	" "	"	10	"	80	108	" "	164	"
3626	"	18	Am.	----	"	--	--	" "	"	10	"	80	78	" "	188	"
3627	"	22	"	----	"	--	--	" "	"	10	"	90	78	" "	212	"
3628	"	22	Can.	5	"	--	--	" "	"	10	"	80	108	" "	164	"
3629	"	26	Scot.	9	m	2	--	" "	day	10	"	2 00	26	" "	574	"
3630	"	26	Am.	----	"	2	1	" "	"	10	"	2 00	18	" "	590	"
3631	"	21	Hol.	13	s	--	--	" "	pc.	10	"	1 00	104	" "	209	"
3632	"	57	Am.	----	"	--	--	" "	"	9	"	40	none	----------------	125	"
3633	Detroit -----	19	Swiss	----	"	--	--	" "	"	9	"	2 00	30	Lack of work	566	------
3634	" -----	16	"	----	"	--	--	" "	"	9	"	70	104	" "	146	------
3635	" -----	16	"	----	"	--	--	" "	wk.	9	"	70	none	----------------	219	100
3636	" -----	19	"	----	"	--	--	" "	pc.	10	"	2 00	"	----------------	626	200
3637	" -----	16	"	----	"	--	--	" "	"	10	"	70	"	----------------	219	------
3638	" -----	16	Ger.	----	"	--	--	" "	wk.	9	----	70	"	----------------	219	------
3639	Jackson ----	17	Am.	----	"	--	--	Crater ------	day	10	no	83	"	----------------	260	18
3640	" ----	18	"	----	"	--	--	" ------	"	10	"	83	6	Sickness -----	256	5
3641	" ----	19	"	----	"	--	--	" ------	"	10	"	1 25	6	Lack of work	384	none
3642	" ----	19	"	----	"	--	--	" ------	"	10	"	1 25	6	Sickness -----	384	"
3643	" ----	20	"	----	"	--	--	" ------	"	10	"	1 00	none	----------------	313	"
3644	" ----	18	"	----	"	--	--	" ------	"	10	"	1 00	30	Sickness -----	283	30
3645	" ----	34	"	----	m	2	--	" ------	"	10	"	1 50	60	Lack of work	380	75
3646	" ----	42	"	----	"	2	--	" ------	pc.	10	"	1 50	30	" "	425	none
3647	" ----	38	"	----	"	2	1	" ------	"	10	"	1 50	30	" "	425	"
3648	" ----	23	"	----	s	--	--	" ------	day	10	"	1 25	none	----------------	391	50
3649	" ----	25	Irish	----	"	--	--	" ------	"	10	"	1 25	2	Sickness -----	389	none
3650	" ----	19	Am.	----	"	--	--	" ------	"	10	"	1 10	6	" -----	338	"

* And holidays.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.									no	no	None					yes	no	3601
"									"	"	"					"	yes	3602
"	yes	no	mort.	$200	8	yes	yes		"	"	"					"	"	3603
"									"	"	"					"	"	3604
"									"	"	"					"	"	3605
"											"					no	no	3606
"									yes	no	"					yes	"	3607
"									no	"	"					"	"	3608
"	no							$10 00	yes	"	"					"	yes	3609
"									no	"	Metal Pol. Union*	yes	no	yes	yes	"	"	3610
"									"	"	" " "	"	yes	"	"	"	"	3611
"	no							4 00	"	"	" " "	"	"	"	"	"	"	3612
"									"	"	None					"	"	3613
"	no							3 00	yes	"	"					"	"	3614
"	yes	no	mort.	500	7	yes	no		no	"	"					"	"	3615
"	"	yes					"		"	"	"					"	"	3616
"									yes	"	"					"	"	3617
"									"	"	"					"	"	3618
"									no	"	"					no	no	3619
"									"	"	"					yes	yes	3620
"	no								yes	"	"					"	"	3621
"	yes	no	cont.	500	7	yes	yes		"	"	"					"	"	3622
"									no	"	"					"	"	3623
"									"	"	"					"	"	3624
"									"	"	"					"	"	3625
"									"	"	"					"	"	3626
"									"	"	"					"	"	3627
"									"	"	"					"	"	3628
"	no							9 00	"	"	"					"	"	3629
"	"							9 00	"	"	"					"	"	3630
"									"	"	"					"	no	3631
s-mo.									"	"	"					"	yes	3632
wk.											"					"	no	3633
"											"					"	"	3634
											"							3635
wk.											"					yes	no	3636
"											"							3637
"											"							3638
"									no	no	J. O. U. A. M.					yes	yes	3639
"									"	"	None					"	"	3640
"									"	"	"					"	"	3641
"									"	"	"					"	"	3642
"	yes	yes					yes		"	"	"					"	"	3643
"									"	"	"					"	"	3644
"	no							8 00	yes	"	"					"	"	3645
"	yes	yes					yes		no	"	"					"	"	3646
"	no							6 00	yes	"	"					"	"	3647
"									no	"	"					"	"	3648
"									"	"	Boiler Makers' Un.	no	yes	yes	yes	"	"	3649
"									"	"	None					"	"	3650

* And B. of B. M.

Book No. 74. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work.	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3651	Jackson	24	Am.	----	s	--	--	Crater	day	10	no	$1 25	20	Lack of work	$366	none
3652	"	47	"	----	m	2	3	"	"	10	"	1 00	none	----	313	"
3653	"	29	"	----	s	--	--	"	"	10	"	1 25	"	----	391	"
3654	"	23	"	----	"	--	--	"	"	10	"	1 50	"	----	470	$50
3655	"	27	"	----	m	2	1	"	"	10	"	1 50	6	Sickness	460	none
3656	"	42	"	----	"	2	1	"	"	10	"	1 00	6	Pleasure	307	"
3657	"	27	"	----	"	2	2	"	"	10	"	1 00	30	Sickness	283	"
3658	"	32	"	----	"	2	--	"	"	10	"	1 25	none	----	391	"
3659	"	23	"	----	s	--	--	"	"	10	"	1 25	12	Lack of work	376	50
3660	"	24	"	----	m	2	--	"	"	10	"	1 75	30	Sickness	495	200
3661	"	27	"	----	"	2	1	"	"	10	"	1 50	10	"	455	25
3662	"	23	"	----	"	2	--	"	"	10	"	1 25	60	Lack of work	316	none
3663	"	23	"	----	s	--	--	"	"	10	"	1 25	10	" "	379	"
3664	"	28	"	----	"	--	--	"	"	10	"	1 25	none	----	391	"
3665	"	18	Ger.	----	"	--	--	"	"	10	"	1 00	"	----	318	"
3666	"	53	Irish	20	m	2	1	"	"	10	yes	1 50	50	Lack of work	395	"
3667	"	23	"	8	s	--	--	"	"	10	"	1 25	50	Sickness	330	"
3668	"	22	"	----	m	2	--	"	"	10	"	1 25	50	Laid off	330	"
3669	"	22	"	----	"	2	--	"	"	10	"	1 35	75	Sickness	321	"
3670	"	22	"	----	s	--	--	"	w'k.	10	"	1 25	100	Laid off	266	"
3671	"	24	Am.	----	"	--	--	"	day	10	"	1 35	50	"	355	"
3672	Flint	19	Can.	13	"	--	--	"	"	10	"	1 00	90	"	223	"
3673	"	21	Am.	----	"	--	--	"	"	10	"	1 00	90	"	223	"
3674	"	33	"	----	m	2	4	"	"	10	no	1 00	60	Lack of work	253	"
3675	"	38	"	----	"	2	--	"	"	10	"	1 00	120	" "	193	"
3676	"	47	"	----	"	3	4	"	"	10	"	1 00	156	" "	157	"
3677	"	27	"	----	"	2	--	"	"	10	"	1 00	90	" "	223	"
3678	"	23	"	----	s	--	--	"	"	10	"	1 25	120	" "	241	"
3679	"	22	Eng.	12	"	--	--	"	"	10	"	1 00	12	Sickness	301	"
3680	"	45	Ger.	22	m	3	--	"	"	10	"	1 00	75	Lack of work	238	"
3681	"	18	Am.	----	s	--	--	"	"	10	"	1 00	180	" "	133	"
3682	"	25	"	----	m	2	1	"	"	10	yes	1 12	10	" "	344	"
3683	"	24	"	----	s	--	--	"	"	10	no	1 00	60	" "	253	50
3684	"	36	"	----	m	2	1	"	"	10	"	1 25	36	" "	310	none
3685	"	23	"	----	s	--	--	"	"	10	"	1 35	30	" "	382	100
3686	"	24	"	----	m	2	1	"	"	10	"	1 32	45	" "	354	none
3687	"	26	"	----	"	2	2	"	"	10	yes	1 33	2	Pleasure	418	50
3688	"	52	"	----	"	2	5	"	"	10	no	1 18	40	Lack of work	308	none
3689	"	46	Ger.	22	"	2	5	"	"	10	"	1 18	90	" "	252	"
3690	"	26	Am.	----	s	--	--	"	"	10	yes	1 30	2	" "	404	50
3691	"	20	"	----	"	--	-	"	"	10	no	1 00	180	" "	133	20
3692	"	19	"	----	"	--	--	"	"	10	"	1 00	10	Sickness	308	none
3693	"	16	"	----	"	--	--	"	"	10	yes	1 00	6	Lack of work	307	"
3694	"	26	"	----	m	2	3	"	"	10	"	1 33	10	" "	408	60
3695	"	22	"	----	s	--	--	"	"	10	no	1 25	30	" "	354	100
3696	"	20	"	----	"	--	-	"	"	10	"	1 00	24	Sickness	289	50
3697	"	42	"	----	m	2	5	"	"	10	yes	2 00	12	Lack of work	602	none
3698	Detroit	26	"	----	"	2	2	"	"	10	no	1 25	90	" "	380	"
3699	"	30	"	----	s	--	--	"	"	10	"	1 50	15	" "	447	"
3700	"	29	"	----	"	--	--	"	"	10	"	1 50	none	----	470	"

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.									no	no	None					yes	yes	3651
"	no							$5 00	"	"	"					"	"	3652
"									"	"	"					"	"	3653
"									"	"	"					"	"	3654
"	yes	yes					yes		"	"	"					"	"	3655
"	"	no	mort.	$500	7	yes	"		"	"	"					"	"	3656
"	no							7 00	"	"	"					"	"	3657
"	"							9 00	"	"	"					"	"	3658
"									"	"	"					"	"	3659
"	no							8 00	yes	yes	"					"	"	3660
"	yes	yes					yes		no	no	"					"	"	3661
"	no							8 00	"	"	"					"	"	3662
"	"							8 00	"	"	"					"	"	3663
"	"							8 00	"	"	"					"	"	3664
"									"	"	"					"	"	3665
s-mo.	no							7 00	yes	"	"					"	"	3666
"	"							12 00			"					"	"	3667
"	"							6 00			Stone Masons U'n	yes	no	yes	yes	no	"	3668
"	"							7 00			None					"	"	3669
"											"					"	"	3670
"											"					"	"	3671
"									no	no	"					yes	"	3672
"									"	"	"					"	"	3673
wk.	yes	yes					yes		yes	"	"					"	"	3674
"	no							7 00	"	"	"					"	"	3675
"	yes	no	mort.	100	7	yes	yes			"	"					"	"	3676
"	no							2 00		"	"					"	"	3677
"										"	"					"	"	3678
"	yes	no					no				"					"	no	3679
"	"	"	mort.	100	8	yes	yes		yes	no	"					"	yes	3680
"										"	"					"	"	3681
"	no							3 00		"	"					"	"	3682
"									yes		"					"	"	3683
"	no							8 00	"		"					"	"	3684
"									no	no	"					"	"	3685
"	no							4 00	yes	"	"					"	"	3686
"	yes	yes					no		"	"	"					"	"	3687
"	no							6 00	no	"	"					"	"	3688
"	"							5 00	"	"	"					"	"	3689
"									"	"	"					"	"	3690
"									"	"	"					no	"	3691
"									"	"	"					yes	"	3692
"									"	"	"					"	"	3693
"	no							5 00	yes	"	"					"	"	3694
"									no	"	"					"	"	3695
"									"	"	"					"	"	3696
"	yes	yes					yes		yes	"	"					"	"	3697
s-mo.	no							10 00	no	"	"					"	"	3698
"											"					"	"	3699
"									no	no	"					"	"	3700

Book No. 75. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single.	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
8701	Detroit	38	Am.	----	m	2	3	Crater	day	10	no	$1 50	60	Lack of work	$380	none
8702	" ----	36	Ger.	8	"	2	3	" ------	"	10	"	1 25	none	---------------	391	"
8703	" ----	33	Am.	----	"	2	1	" ------	"	10	"	1 50	90	Sickness* ----	385	"
8704	" ----	31	"	----	"	2	2	" ------	"	10	"	1 50	60	" -----	380	"
8705	" ----	21	Ger.	4	s	--	--	" -----	"	10	"	1 00	60	" *----	253	"
8706	" ----	22	Am.	----	"	--	--	" ------	"	10	"	1 25	90	Lack of work	279	"
8707	" ----	28	"	----	m	2	--	" ------	"	10	"	1 25	90	" "	316	"
8708	" ----	31	"	----	s	--	--	" ------	"	10	"	1 50	none	---------------	470	"
8709	" ----	27	"	----	"	--	--	" ------	wk.	10	"	1 75	"	---------------	548	$150
8710	" ----	18	"	----	"	--	--	" ------	"	10	"	75	"	---------------	225	none
8711	" ----	38	Ger.	11	m	2	2	" ------	day	10	"	1 50	60	Lack of work	380	50
8712	" ----	21	Am.	----	s	--	--	" ------	"	10	"	1 25	90	" "	380	none
8713	" ----	34	Ger.	11	m	2	2	" ------	"	10	"	1 25	none	---------------	391	"
8714	Pontiac ----	29	Am.	----	"	2	--	" ------	"	10	"	1 25	50	Lack of work	329	50
8715	" ----	29	Scot.	1	s	--	--	" ------	"	10	"	1 25	100	Other business	266	none
8716	" ----	24	Am	----	"	--	--	" ------	"	10	"	1 25	157	---------------	195	------
8717	" ----	25	"	----	"	--	--	" ------	"	10	"	1 25	208	Lack of work	231	none
8718	" ----	20	"	----	"	--	--	" ------	"	10	"	1 25	96	" "	271	"
8719	" ----	23	"	----	"	--	--	" ------	"	10	"	1 25	6	" "	384	"
8720	" ----	24	"	----	"	--	--	" ------	"	10	"	1 25	12	" "	376	"
8721	" ----	36	"	----	m	2	2	" ------	"	10	"	1 40	12	" "	421	"
8722	" ----	16	"	----	s	--	--	" ------	wk.	10	"	35	78	Sickness* ----	200	"
8723	Marshall ---	30	"	----	"	--	--	" ------	day	10	yes	1 25	30	Lack of work	554	25
8724	" ---	44	"	----	m	2	--	" ------	"	10	"	1 75	12	" "	177	------
8725	" ---	26	"	----	"	2	--	" ------	"	10	"	1 00	none	---------------	313	------
8726	Wayne -----	46	"	----	"	4	--	" ------	"	10	no	1 12	60	Lack of work	283	------
8727	" -----	22	"	----	s	--	--	" ------	"	10	yes	1 00	40	" "	278	none
8728	" -----	19	"	----	"	--	--	" ------	"	10	"	1 00	60	Pleasure* ----	253	"
8729	Charlotte --	31	"	----	m	2	2	" ------	wk.	10	"	1 50	60	Lack of work	379	150
8730	" --	29	"	----	"	2	1	" ------	"	10	"	1 25	60	" "	316	none
8731	" --	24	"	----	"	3	2	" ------	"	10	"	1 25	60	" "	316	50
8732	Coldwater --	17	"	----	s	2	1	" ------	day	10	"	50	30	" "	142	none
8733	" --	22	"	----	"	--	--	" ------	"	10	no	1 00	90	" "	223	"
8734	Owosso -----	17	"	----	"	--	--	" ------	wk.	10	----	50	none	---------------	157	------
8735	" -----	41	Can.	8	m	2	1	" ------	day	10	no	1 25	100	Lack of work	266	none
8736	White Pigeon	19	Am.	----	s	--	--	" ------	"	10	"	75	150	" "	122	"
8737	" "	20	"	----	"	--	--	" ------	"	10	"	75	90	" "	167	"
8738	Bay City ---	18	"	----	"	--	--	" ------	"	10	yes	1 15	10	Sickness -----	348	"
8739	Kalamazoo.	39	"	----	m	2	--	" ------	"	10	----	1 50	156	Lack of work	235	"
8740	Lowell -----	42	Ger.	----	"	2	3	" ------	"	10	yes	1 25	40	" "	341	"
8741	G'd Rapids.	27	Am.	----	"	2	1	Packer -----	"	10	no	1 10	78	" "	259	"
8742	"	44	Aus.	10	"	2	9	" -----	"	10	"	1 00	none	---------------	313	"
8743	"	50	Hol.	17	"	2	6	" -----	"	10	"	1 10	52	Lack of work	287	"
8744	"	41	Am.	----	"	2	--	" -----	"	10	yes	1 50	14	" "	507	"
8745	"	61	"	----	"	2	9	" -----	"	10	"	1 25	none	---------------	440	180
8746	"	18	"	----	s	--	--	" -----	wk.	10	no	68	78	Lack of work	157	none
8747	"	20	Can.	10	"	--	--	" -----	day	10	yes	1 00	52	" "	261	"
8748	"	29	"	27	m	2	--	" -----	"	10	"	1 50	none	---------------	470	"
8749	"	27	Am.	----	s	--	--	" -----	"	10	no	1 50	104	Lack of work	314	"
8750	Detroit -----	18	"	----	"	--	--	" -----	wk.	10	"	75	90	" "	167	"

* And lack of work.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.	no	----	----	----	----	----	----	$6 00	no	no	None	----	----	----	----	yes	yes	3701
"	yes	yes	----	----	----	----	----	----	yes	"	"	----	----	----	----	"	"	3702
"	no	----	----	----	----	----	----	7 00	"	"	"	----	----	----	----	"	"	3703
"	yes	no	----	$400	7	yes	yes	----	"	"	"	----	----	----	----	"	"	3704
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	3705
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3706
"	no	----	----	----	----	----	----	7 00	"	"	"	----	----	----	----	"	"	3707
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	3708
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	3709
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3710
"	yes	yes	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3711
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3712
"	yes	yes	----	----	----	----	----	----	yes	yes	"	----	----	----	----	"	"	3713
wk.	no	----	----	----	----	----	----	7 00	"	no	"	----	----	----	----	"	"	3714
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	3715
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	no	3716
"	----	----	----	----	----	----	----	----	no	----	"	----	----	----	----	"	yes	3717
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	3718
"	----	----	----	----	----	----	----	----	yes	----	"	----	----	----	----	"	"	3719
"	no	----	----	----	----	----	----	8 00	----	----	"	----	----	----	----	"	"	3720
"	"	----	----	----	----	----	----	8 00	yes	no	"	----	----	----	----	"	no	3721
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	yes	3722
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	3723
"	no	----	----	----	----	----	----	8 00	yes	----	"	----	----	----	----	"	no	3724
"	"	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	yes	3725
s-mo.	"	----	----	----	----	----	----	5 00	yes	"	"	----	----	----	----	"	"	3726
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	3727
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	3728
wk.	yes	no	mort.	200	7	yes	yes	----	no	no	"	----	----	----	----	"	no	3729
"	no	----	----	----	----	----	----	4 00	"	"	"	----	----	----	----	"	yes	3730
"	yes	no	mort.	110	7	yes	yes	----	"	"	"	----	----	----	----	"	"	3731
"	"	yes	----	----	----	----	"	----	"	"	"	----	----	----	----	"	"	3732
"	"	"	----	----	----	----	"	----	"	"	"	----	----	----	----	"	"	3733
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	3734
"	no	----	----	----	----	----	----	8 00	----	----	"	----	----	----	----	"	"	3735
s-mo.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	3736
"	----	----	----	----	----	----	----	----	no	----	"	----	----	----	----	"	"	3737
wk.	----	----	----	----	----	----	----	----	yes	no	"	----	----	----	----	"	"	3738
"	no	----	----	----	----	----	----	6 00	----	----	"	----	----	----	----	"	"	3739
mo.	yes	yes	----	----	----	----	yes	----	yes	yes	"	----	----	----	----	"	"	3740
wk.	no	----	----	----	----	----	----	3 50	no	no	"	----	----	----	----	no	no	3741
"	"	----	----	----	----	----	----	6 00	"	"	"	----	----	----	----	yes	"	3742
"	yes	yes	----	----	----	----	yes	----	"	"	"	----	----	----	----	"	"	3743
s-mo.	"	no	mort.	250	7	yes	"	----	"	"	"	----	----	----	----	"	yes	3744
"	no	----	----	----	----	----	----	7 00	yes	yes	"	----	----	----	----	"	"	3745
wk.	----	----	----	----	----	----	----	----	"	no	"	----	----	----	----	"	"	3746
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	3747
"	yes	no	cont.	600	7	yes	yes	----	yes	"	"	----	----	----	----	"	"	3748
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	3749
s-mo.	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	3750

Book No. 76.

Table No. 1.—CONTINUED.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3751	Detroit	34	Am.		m	2	4	Packer	day	10	no	$1 50	none		$470	none
3752	Charlotte	16	"		s			"	pc.	10	yes	40	100	Lack of work	85	$15
3753	"	40	"		m	2	4	Turner	wk.	10	no	1 25	90	" "	279	none
3754	Jackson	29	"		s			"	day	10	"	1 65	60	Sickness*	417	"
3755	G'd Rapids	39	Hol		m	2	6	"	"	10	"	2 00	104	Lack of work	418	"
3756	Ionia	41	Am.		"	2	2	Shaper	"	10	"	1 20	90	Accident*	268	"
3757	"	33	"		"	2	1	"	"	10	"	2 25	104	Lack of work	470	"
3758	Mt. Clemens	27	Ger.	12	"	2	2	"	"	10	"	1 25	12	Holidays	376	150
3759	Pontiac	43	Am.		"	2	2	"	"	10	---	2 00	none		626	none
3760	Jackson	19	"		s			Cutter	"	10	yes	1 00	12	Lack of work	301	"
3761	"	21	"		m	2		"	pc.	10	"	1 50	60	Sickness*	380	"
3762	"	24	Pol.	9	s			"	day	10	"	1 50	20	Lack of work	450	50
3763	Lansing	6	Ger.	14	"			"	"	10	no	50	57	" "	128	25
3764	Three Rivers	38	Am.		m	2	3	"	pc.	10	"	1 75	90	Sickness*	390	none
3765	Ionia	21	"		s			Planer	day	10	"	95	60	Lack of work	240	"
3766	"	32	Ger.		"			"	"	10	"	1 35	60	" "	342	40
3767	Lansing	43	"	9	m	2	6	"	"	10	"	1 25	20	Sickness	366	none
3768	"	36	Am.		"	2	4	"	"	10	"	1 85	40	Lack of work	369	"
3769	Kalamazoo	45	"		"	2		Spoke driver	pc.	10	---	2 00	90	" "	446	50
3770	"	28	"		"	2	1	"	"	10	---	2 00	30	" "	566	200
3771	"	40	"		"	2	2	"	"	10	---	2 00	30	" "	566	180
3772	"	35	"		"	2	2	"	"	10	no	1 50	30	" "	425	50
3773	"	23	"		"	2		"	"	10	"	1 50	30	" "	425	100
3774	"	24	"		s			"	"	10	"	1 35	30	" "	382	none
3775	Jackson	24	"		"			"	"	10	"	2 00	30	Sickness*	566	"
3776	"	44	Irish		m	2	1	"	"	10	yes	1 85	90	Lack of work	413	"
3777	"	27	Am.		"	2		"	"	10	no	2 25	75	" "	536	"
3778	"	21	"		s			"	"	10	"	1 40	100	" "	298	"
3779	Lansing	29	Ger.	4	"			"	day	10	"	1 25	50	" "	329	"
3780	Ionia	32	"	13	m	2	1	"	"	10	"	1 50	60	" "	380	"
3781	Detroit	23	Am.		s			Driller	pc.	10	"	1 50	30	" "	325	100
3782	"	23	"		"			"	"	10	"	1 50	none		470	none
3783	"	5	"		"			"	"	10	"	1 50	90	Lack of work	335	"
3784	"	33	Ger.	21	m	4		"	day	10	"	2 00	14	Pleasure	598	150
3785	"	24	Irish	14	s			"	"	10	"	1 50	40	Lack of work	410	none
3786	"	26	Am.		m	2		"	"	10	"	1 50	14		448	150
3787	"	20	"		s			"	"	10	"	1 25	130	Lack of work	229	none
3788	Three Rivers	45	"		m	2	1	"	"	10	"	1 60	40		437	"
3789	Jackson	41	Pol.	5	"	2		Grinder	pc.	10	yes	1 50	45	Vacation*	402	"
3790	"	36	"	6	"	3		"	"	10	"	1 25	90	Accident	279	"
3791	"	27	"	12	s			"	"	10	"	1 50	150	Lack of work	245	"
3792	"	36	"	6	m	3		"	"	10	"	2 00	30	Vacation	566	"
3793	"	34	"	8	"	2		"	"	10	"	2 00	30	Pleasure	566	"
3794	"	37	"	14	"	6		"	"	10	"	1 50	21	Lack of work	438	"
3795	"	33	"	8	"	4		"	"	10	"	2 00	15	Sickness	596	100
3796	"	33	"	10	s			"	"	10	"	2 00	60	"	506	none
3797	"	35	"	6	m	2		"	"	10	"	1 25	40	Vacation	341	"
3798	"	40	"	5	"	2		"	"	10	"	2 00	30	"	566	25
3799	"	36	"	5	"	3		"	"	10	"	1 50	30	"	425	none
3800	"	34	"	6	"	2		"	"	10	"	2 00	21	Lack of work	584	"

* And lack of work.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.	no							$8 50	yes		None					yes	no	3751
wk.									no	no	"					"	yes	3752
"	yes	yes							yes	yes	"					"	"	3753
"									no	no	"					"	"	3754
"	yes	no	mort.	$650	7	yes	yes		"	"	"					"	"	3755
s-mo.	no							10 00	yes	"	"					"	"	3756
"	"							6 00	no	"	M. Woodw'k's U'n	yes	yes	yes	yes	"	"	3757
wk.	yes	no			6	yes	yes				*	no	"	no	no	no	no	3758
"	no							8 00	no	yes	None					yes	yes	3759
"									"	no	"					no	no	3760
"	no							7 00	yes	"	"					yes	yes	3761
"											"					"	"	3762
s-mo.									no	no	"							3763
wk.	yes	no	mort.	825	6		yes		yes	yes	"					yes	yes	3764
s-mo.									"	no	"					"	"	3765
"									"	"	"					"	"	3766
wk.	no							5 00	no	"	"					"	"	3767
s-mo.	yes	no	mort.	600	7	no	yes		"	"	"					"	no	3768
wk.	no							8 00			Wheelm'k's Union					"	yes	3769
"	yes	no	mort.	225	7	yes	yes				" "					"	"	3770
"	"	yes					"				None					"	"	3771
"	no							7 00			Wheelm'k's Union					"	"	3772
"	yes	no	cont.	150	7	yes	yes				" "					"	"	3773
"											" "					"	"	3774
"									no	no	None					"	"	3775
"	no							8 00	"	"	"					no	"	3776
"	"								"	"	"					yes	"	3777
"									yes	"	"					"	"	3778
s-mo.									"	"	"					"	"	3779
"	yes	no	mort.	300	7	yes	yes		"	"	"					"	no	3780
"									no	"	"					"	yes	3781
"											"					"	"	3782
"									yes	no	"					"	"	3783
wk.	yes	no	mort.	100	6	yes	yes				"					"		3784
"											"					no		3785
"	no							8 00			"					yes		3786
"											"					"		3787
"	yes	yes					yes		no	no	"					"	no	3788
"	no								"	"	"					"	yes	3789
"	"										"							3790
"									yes	no	"					yes	yes	3791
"	no										"					"	"	3792
	"							5 00			"					"	"	3793
wk.	yes	no	mort.	45	7	yes	yes				"					"	"	3794
"	"	"	"	400	8	"	"				"					"	"	3795
"											"					"	no	3796
"	no										"					"	yes	3797
"	"										"					"	"	3798
"	"										"					"	"	3799
"	"										"					"	no	3800

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* Donaldson Bros. Employés' Sick and Accident Benefit Association.

Book No. 77.

Table No. 1.—Continued.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3801	Mt. Clemens	21	Fr.	----	s	..	..	Grinder	day	10	no	$1 12	12	Pleasure	$387	none
3802	G'd Rapids.	19	Hol.	14	"	..	..	Sander	pc.	10	yes	1 20	104	Lack of work	288	"
3803	"	17	Am.	----	"	..	..	"	"	10	"	1 00	52	" "	292	"
3804	"	19	"	----	"	..	..	"	"	10	"	1 20	156	" "	226	"
3805	"	21	Hol.	4	m	2	..	"	day	10	no	1 00	104	" "	209	"
3806	"	28	Am.	----	s	..	..	"	"	10	"	1 00	none	----	318	"
3807	"	18	"	----	"	..	..	"	pc.	10	"	1 20	182	Lack of work	157	"
3808	"	42	"	----	m	2	1	"	day	10	yes	1 25	156	" " *	245	"
3809	"	20	Ger.	11	s	..	..	"	"	10	"	1 25	none	----	440	$100
3810	"	27	"	12	m	2	2	"	"	10	"	1 75	28	Lack of work	570	50
3811	"	25	Hol.	5	s	..	..	"	"	10	"	1 00	24	" "	298	20
3812	"	28	"	4	m	2	1	"	"	10	"	1 20	156	" "	208	none
3813	"	47	"	4	"	2	3	"	"	10	"	90	52	" "	245	"
3814	Coldwater	21	Ger.	----	s	1	3	"	pc.	10	"	1 25	90	" "	299	"
3815	"	21	Am.	----	m	2	..	"	"	10	"	1 25	12	" "	377	"
3816	"	29	"	----	"	2	1	"	"	10	"	1 25	60	" "	316	"
3817	Detroit	26	"	----	s	..	..	"	day	10	no	1 50	90	" "	335	"
3818	Jackson	64	Irish	38	m	6	..	"	"	10	yes	1 15	35	" "	320	"
3819	Ionia	41	Eng.	16	s	..	..	"	"	10	no	1 13	78	" "	268	"
3820	Lowell	23	Am.	----	"	..	..	"	"	10	"	1 25	200	" "	141	"
3821	G'd Rapids.	25	"	----	"	..	..	Bender	"	10	"	1 15	78	" "	270	"
3822	"	48	"	----	"	..	..	"	"	10	"	1 50	234	" "	118	"
3823	"	18	"	----	"	..	..	"	wk.	10	"	67	208	" "	70	"
3824	"	25	"	----	m	2	2	"	day	10	"	1 25	72	" "	301	"
3825	"	36	"	----	"	2	2	"	"	10	"	1 25	12	" "	376	"
3826	Lansing	49	"	----	"	2	2	"	pc.	10	"	1 50	40	" "	410	150
3827	"	45	"	----	"	3	1	"	"	10	"	2 00	26	" "	574	none
3828	"	26	"	----	"	2	..	"	day	10	"	1 25	52	" "	326	"
3829	"	54	"	----	"	2	3	"	"	10	"	1 25	234	" " *	79	----
3830	Kalamazoo.	30	"	----	s	..	..	"	pc.	10	----	2 00	35	" "	556	100
3831	"	28	"	----	"	..	..	"	"	10	----	2 00	60	" "	506	none
3832	"	30	"	----	"	..	..	"	"	10	----	2 25	30	" "	687	250
3833	Coldwater	46	"	----	m	2	4	"	day	10	yes	1 50	30	Sickness	425	50
3834	"	60	"	----	"	2	4	"	"	10	"	1 25	60	Lack of work	354	none
3835	Pontiac	25	"	----	"	2	..	"	"	10	----	2 00	none	----	626	"
3836	"	21	"	----	"	2	1	"	"	10	---	1 25	"	----	391	"
3837	G'd Rapids.	18	"	----	s	..	..	Buffer	"	10	no	1 25	104	Lack of work	261	"
3838	"	28	"	----	m	2	1	"	"	10	yes	1 50	12	" "	474	"
3839	"	21	Ger.	9	s	..	..	"	"	10	no	1 75	52	Pleasure	457	"
3840	"	23	"	9	m	2	1	"	"	10	"	2 25	18	Lack of work	664	"
3841	Marshall	17	Am.	----	s	..	..	"	"	10	yes	75	none	----	235	"
3842	"	17	"	----	"	..	..	"	"	10	no	50	60	Lack of work	127	"
3843	"	16	"	----	"	..	..	"	"	10	yes	50	none	----	157	"
3844	Detroit	15	"	----	"	..	..	"	"	10	no	50	182	At school	65	----
3845	"	18	"	----	"	..	..	"	"	10	"	75	60	Lack of work	190	none
3846	Jackson	37	"	----	w	1	..	Welder	pc.	10	yes	2 00	110	Sickness	406	"
3847	"	26	"	----	m	2	..	"	"	10	"	1 75	6	"	537	100
3848	"	38	"	----	"	4	1	Rimmer	"	10	no	1 50	100	Lack of work	320	none
3849	"	18	"	----	s	..	..	"	"	10	yes	1 25	200	" "	141	"
3850	"	19	"	----	"	..	..	"	"	10	no	1 70	100	" "	362	"

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own you home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.											*	no	yes	no	no	yes	yes	3801
s-mo.									no	no	None					"	"	3802
"									"	"	"					"	"	3803
"									"	"	"					"	"	3804
"	no							$4 00	yes	"	"					"	"	3805
"									no	"	"					"	"	3806
"									"	"	"					"	"	3807
"	no							5 50	"	"	"					"	"	3808
"									"	"	"					"	"	3809
"	no							6 00	"	"	"					"	"	3810
"									"	"	"					"	"	3811
wk.	no							4 50	"	"	"					"	"	3812
"	yes	yes					yes		"	"	"					"	"	3813
"	"	"					"		"	"	"					"	"	3814
"	"	no	cont.	$450	7	yes	"		"	"	"					"	"	3815
"	no							5 00	"	"	"					"	"	3816
s-mo.									"	yes	"					"	"	3817
wk.	yes	no	cont.	550	8	yes	no		"	no	"					"	"	3818
s-mo.									"	yes	"					"	"	3819
mo.									"	no	"					"	"	3820
wk.									"	"	"					"	"	3821
"									"	"	"					"	"	3822
"									"	"	"					"	"	3823
"	no							3 00	yes	"	"					no	no	3824
"	"							8 00	no	"	"					yes	yes	3825
"	yes						yes				"					"	"	3826
"	no							7 50	yes	yes	"					"	"	3827
"	"							5 00	"	"	"					"	"	3828
s-mo.	yes	yes					yes		"		"					"	"	3829
wk.											Wheelm'k's Union					"	"	3830
"											" "					"	"	3831
"											None					"	"	3832
"	no							5 00	no	no	"					"	"	3833
"	yes	no	cont.	400	7	yes	yes		"	"	"					"	"	3834
"	no							8 00	"	"	"					"	"	3835
"	"							6 00			"					"	"	3836
"									no	no	"					"	"	3837
"	no							6 00	"	"	"					"	"	3838
s-mo.									"	"	Metal Pol. Union	no	no	yes	yes	"	"	3839
"	no							8 00	yes	yes	" " "	"	"	"	"	"	"	3840
"											None					"	"	3841
"											"					"	"	3842
"											"					"	"	3843
wk.											"							3844
"											"					yes		3845
"	yes	no	mort.	700	7	yes	yes		yes	yes	Iron Molders' Un.	yes	yes	yes	yes	"	yes	3846
"	"	"	"	140	6	"	"		"	no	None					"	no	3847
"	"	"	cont.	350	7	no	"		no	"	"					"	yes	3848
"									"	"	"					"	"	3849
"									"	"	"					"	no	3850

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* Donaldson Bros'. Employés Sick and Accident Benefit Association.

Book No. 78. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3851	Jackson	27	Fr.	----	m	2	--	Rimmer	pc.	10	yes	$2 00	25	Lack of work	$576	none
3852	"	24	Am.	----	s	--	--	Roller	"	10	"	1 75	26	Sickness	502	"
3853	"	32	Ger.	12	m	2	--	"	"	10	"	1 75	60	Lack of work	443	"
3854	"	16	Am.	----	s	--	--	Riveter	day	10	"	1 10	40	Holidays *	300	"
3855	G'd Rapids	23	Eng.	17	"	--	--	Plater	"	10	"	2 00	26	Lack of work	588	$100
3856	"	26	Am.	----	"	--	--	"	"	10	no	1 50	none	----	469	none
3857	"	20	"	----	"		--	"	"	10	"	1 75	6	Pleasure	537	"
3858	"	22	"	----	"		--	"	"	10	yes	3 00	none	----	1,056	150
3859	Jackson	22	"	----	"	4	2	"	"	10	"	2 00	15	Vacation	596	100
3860	Detroit	34	"	----	m	4	--	"	"	10	"	2 50	14	Sickness	800	none
3861	Marshall	32	"	----	"	3	2	"	"	10	"	2 50	none	----	783	"
3862	Bay City	38	"	----	"	2	1	"	"	10	"	3 00	30	Vacation	849	"
3863	G'd Rapids	24	"	----	"	2	2	Japaner	"	10	"	3 00	6	Pleasure	1,038	50
3864	"	49	Ger.	42	"	2	--	"	"	10	"	1 50	130	Lack of work	275	none
3865	"	39	Am.	----	"	2	2	"	"	10	"	3 00	182	Sickness *	435	"
3866	"	28	"	----	s	--	--	Brazer	"	10	"	2 25	156	Lack of work	378	"
3867	"	38	"	----	m	2	1	"	"	10	no	1 50	none	----	470	"
3868	"	31	"	----	s	--	-	"	"	10	yes	2 50	182	Lack of work	328	"
3869	"	17	"	----	"	-	-	"	"	10	no	1 25	52	" "	326	"
3870	"	26	Can.	25	m	2	-	"	pc.	10	"	3 50	52	Sickness	913	"
3871	"	25	Am.	----	"	2	2	"	"	10	yes	3 50	91	Lack of work	885	"
3872	"	26	Ger.	7	"	2	1	"	day	10	no	1 75	78	" "	411	"
3873	Bay City	39	Am.	----	"	2	7	"	"	10	"	1 50	40	" "	410	"
3874	" "	34	Can	33	"	2	1	"	"	10	"	1 30	36	" "	360	"
3875	" "	31	"	----	"	2	3	"	"	10	"	1 35	90	Sickness *	301	"
3876	Detroit	25	Am.	----	"	3	--	"	"	10	"	2 00	200	"	226	"
3877	"	55	"	----	"	2	7	"	"	10	"	2 00	none	----	626	"
3878	"	22	Can.	1	s	--	--	"	"	10	"	1 25	50	Lack of work	329	"
3879	G'd Rapids	17	Rus.	10	"	--	--	Solderer	wk.	10	"	66	182	Sickness	87	"
3880	Detroit	23	Am.	----	m	2	1	"	pc.	10	"	1 25	50	Lack of work	329	"
3881	Bay City	21	"	----	s	--	--	"	day	10	"	1 50	13	Vacation	450	75
3882	G'd Rapids	25	Hol.	16	"	--	--	Gluer	"	10	"	1 25	none	----	391	none
3883	"	17	"	15	"	--	--	"	wk.	10	"	66	130	Lack of work	122	"
3884	"	27	"	18	m	2	1	"	day	10	"	1 25	78	" "	294	"
3885	"	50	"	24	"	2	2	"	"	10	"	1 50	156	" "	235	"
3886	"	33	Am.	----	"	2	--	"	"	10	"	1 25	78	" "	294	"
3887	Detroit	--	"	----	s	--		Brushmaker	pc.	9	"	1 50	52	" "	392	"
3888	"	30	Ger.	----	m	2	3	"	day	9	"	1 25	74	" "	299	"
3889	"	20	"	----	s	--	-	"	"	9	"	90	52	" "	235	"
3890	"	21	"	----	"	--	--	"	"	9	----	1 08	35	----	300	----
3891	"	22	"	5	m	2	1	"	"	9	no	1 00	26	Lack of work	287	none
3892	"	23	"	----	s	--	-	"	"	9	"	90	156	" "	141	"
3893	"	40	Am.	----	m	2	--	"	wk.	9	"	1 75	none	----	548	"
3894	Jackson	37	Irish	----	s	--		Gear worker	pc.	10	"	1 50	"	----	470	50
3895	"	20	Ger.	----	m	2	1	"	"	10	"	1 50	6	Sickness	461	none
3896	"	22	Am.	----	s	--	--	"	"	10	"	1 50	10	"	455	60
3897	"	24	"	----	m	2	--	"	day	10	"	1 50	60	Lack of work	380	none
3898	"	26	"	----	s	--		"	pc.	10	"	1 50	90	" "	335	50
3899	"	42	"	----	m	2	1	"	"	10	yes	1 50	60	" "	380	none
3900	Flint	29	"	----	"	2	--	"	"	10	"	1 25	1	Sickness	390	"

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* And lack of work.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	no							$4 00	no	no	None					yes	no	3851
"									yes	yes	"					"	yes	3852
"	no							6 50	"	no	"					"	"	3853
"									no	"	"					"	"	3854
"									yes	yes	"					"	no	3855
"									no	no	"					"	yes	3856
"									yes	"	Metal Pol. Union	no	no	yes	yes	"	"	3857
s-mo.									no	"	" " "	"	"	"	"	"	"	3858
wk.											None					"	"	3859
"	no							10 00			"					"		3860
s-mo.	yes	yes					yes		yes		"					"	yes	3861
wk.	no							13 00	"	no	Metal Pol. Union	yes	yes	yes	yes	"	"	3862
s-mo.	"							7 00	"	"	P. & D. I. U.	no	no	"	"	"	"	3863
wk.	"							2 50	no	"	None					no	"	3864
"	yes	no	mort.	$500	8	yes	yes		yes	"	"					yes	"	3865
"									no	"	"					"	"	3866
"	no							5 00	yes	"	"					"	"	3867
"									no	"	"					"	"	3868
s-mo.									"	"	"					"	"	3869
"	no							7 00	"	"	B. of B. M.	no	no	no	yes	"	"	3870
"	"							5 00	yes	"	"	"	"	"	"	"	"	3871
wk.	"							5 00	no	"	"	"	"	"	"	"	"	3872
"	yes	yes					yes		yes	"	None					"	"	3873
"	"	"					"		"	"	"					no	no	3874
"	"	no	mort.	750	7	no	"		"	yes	"					yes	yes	3875
"	no							9 00			"					"		3876
	"							16 00			"					"		3877
wk.											"					no		3878
s-mo									no	no	"					"	no	3879
"	no							7 00	"	"	"							3880
wk.									"	"	"					yes	yes	3881
"									"	"	"					"	"	3882
"									"	"	"					"	no	3883
"	no							5 00	yes	"	"					"	yes	3884
"	yes	no	mort.	500	7	yes	yes		"	"	"					"	"	3885
"	no							4 50	no	"	"					"	"	3886
s-mo											"					no	"	3887
"	no							6 50			"					yes	"	3888
"											"					"	"	3889
"											"					"	"	3890
"	no							5 00			"					"	"	3891
"											"					"	"	3892
"	yes	no	cont		7	yes	yes				"							3893
wk.									no	no	"					yes	yes	3894
"	yes	yes					yes		"	"	"					"	"	3895
"									"	"	"					"	"	3896
"	no							7 00	"	"	"					"	"	3897
"									"	"	"					"	"	3898
s-mo.	yes	yes					yes		"	"	"					"	"	3899
wk.	"	"					"		yes	"	"					no	"	3900

Book No. 79.

Table No. 1.—Continued.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3901	Flint	57	Am.	----	m	2	1	Gear worker	pc.	10	no	$1 25	60	Vacation	$316	none
3902	“	47	Can.	24	“	2	--	“ “	“	10	yes	1 25	60	“	316	“
3903	“	36	Am.	----	“	2	2	“ “	day	10	no	1 25	15	Lack of work	372	“
3904	Pontiac	21	“	----	s	--	--	“ “	“	10	yes	1 25	21	“ “ *	365	“
3905	“	24	“	----	“	--	--	“ “	“	10	no	1 50	18	“ “	443	$30
3906	“	20	“	----	“	--	--	“ “	“	10	“	1 50	36	“ “	415	25
3907	“	30	“	----	m	2	2	“ “	“	10	“	1 75	18	“ “	516	none
3908	Lansing	47	Ger.	14	“	4	2	“ “	pc.	10	“	1 80	48	“ “	477	“
3909	“	46	Am.	----	“	2	--	“ “	“	10	“	1 67	42	“ “	458	“
3910	“	39	Ger.	12	“	2	4	Tire setter	day	10	“	1 25	65	“ “	310	“
3911	Pontiac	22	Am.	----	“	2	--	“ “	“	10	“	1 35	18	“ “	398	75
3912	Kalamazoo.	31	“	----	s	--	--	Repairer	“	10	----	1 75	110	“ “	355	none
3913	“	40	“	----	w	1	1	“	“	10	----	2 00	90	“ “	336	100
3914	“	31	“	----	s	--	--	“	“	10	---	2 00	60	“ “	506	none
3915	“	30	“	----	“	--	--	“	“	10	----	2 00	30	“ “	566	100
3916	“	55	“	----	m	2	3	“	---	10	----	2 00	100	“ “	424	none
3917	G'd Rapids	22	“	----	s	--	--	“	day	10	yes	1 75	30	Pleasure	563	250
3918	“	23	“	----	m	2	1	“	“	10	“	1 75	156	Lack of work	343	none
3919	“	30	“	----	“	2	2	“	“	10	“	2 00	none	----------	704	“
3920	“	26	“	----	s	--	--	“	“	10	no	2 50	“	----------	782	“
3921	Jackson	18	“	----	“	--	--	“	wk.	10	yes	1 00	2	Pleasure	311	“
3922	“	22	“	----	m	2		“	day	10	“	1 25	100	Lack of work	266	“
3923	“	23	“	----	s	--	--	“	wk.	10	“	1 55	50	“ “	408	100
3924	Detroit	24	Can.	2	m	2	--	“	day	10	“	1 75	none	----------	575	150
3925	“	20	“	2	s	--	--	“	“	10	no	1 00	104	Lack of work	209	none
3926	Bay City	25	Am.	----	“	--	--	“	“	10	“	1 50	18	Sickness	443	“
3927	G'd Rapids	26	“	----	“	--	--	Assembler	“	10	“	1 50	156	Lack of work	236	“
3928	“	24	“	----	“	--	--	“	“	10	“	1 50	156	“ “	235	“
3929	“	32	“	----	m	2	1	“	“	10	“	2 00	none	----------	626	“
3930	“	34	“	----	“	2	2	“	“	10	“	2 00	18	Sickness	590	“
3931	“	23	“	----	“	2	--	“	“	10	“	1 50	104	Lack of work	314	“
3932	“	19	Ger.	15	s	--	--	“	“	10	yes	1 25	104	“ “	310	“
3933	“	23	Swe.	15	“	--	--	“	“	10	“	1 35	78	“ “	370	“
3934	“	21	Am.	----	“	--	--	“	“	10	“	1 75	18	“ “	515	“
3935	“	24	“	----	“	--	--	“	“	10	“	2 00	26	“ “	574	150
3936	“	38	“	----	m	2	3	“	“	10	“	2 50	6	“ “	768	none
3937	“	22	Can.	18	s	--	--	“	pc.	10	“	2 25	none	----------	720	“
3938	“	25	Am.	----	m	2		“	day	10	“	1 50	156	Lack of work	249	“
3939	“	30	“	----	“	2	2	“	“	10	no	1 50	208	“ “	157	“
3940	“	25	“	----	“	2	--	“	“	10	yes	1 35	130	“ “	247	“
3941	Detroit	42	Scot.	40	“	2	1	“	“	10	“	1 75	208	“ “	200	“
3942	“	19	Am.	----	s	--	--	“	“	10	“	1 25	20	Pleasure	366	50
3943	“	38	“	----	m	2	--	“	“	10	“	1 50	52	Sickness	400	none
3944	“	21	“	----	s	--	--	“	“	10	“	1 50	52	Lack of work	400	“
3945	“	30	“	----	“	--	--	“	“	10	“	2 00	10	Sickness	700	50
3946	“	16	“	----	“	--	--	“	“	10	“	75	none	----------	250	none
3947	Bay City	35	“	----	m	2	2	“	“	10	no	1 25	100	Lack of work	266	“
3948	“ “	19	“	----	s	--	--	“	“	10	“	1 25	78	“ “	294	“
3949	Marshall	45	“	----	m	3	--	“	“	10	“	2 00	none	----------	626	“
3950	“	19	“	----	s	--	--	Rubber	“	10	yes	75	14	----------	299	“

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance.	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.	no							$8 00	no	no	None					no	no	3901
"	"							5 00	yes	"	"					yes	yes	3902
wk.	yes						yes		no	"	"					no	no	3903
"									"	"	"					yes	yes	3904
"									yes	"	"					"	"	3905
"											"					"	"	3906
"	yes	no	mort.	$400	7	yes	yes		yes	no	"					"	"	3907
s-mo.	"	yes					"		"	"	"					no	"	3908
"	"	"					"		no	"	"					yes	"	3909
"	no							6 00	"	"	"					no	no	3910
wk.	"							6 00	yes	yes	"					yes	yes	3911
"									"		"					"	"	3912
"	no								"		"					"	"	3913
"											"					"	"	3914
"									yes		"					"	"	3915
	yes	yes					yes				"					"	"	3916
s-mo.									no	no	"					"	"	3917
"	no							7 00	"	"	"					"	"	3918
"	"							7 00	"	"	B. of B. M.	no	no	no	yes	"	"	3919
"									yes	"	"	"	"	"	"	"	"	3920
wk.									"	yes	None					"	"	3921
"	no										"					"	"	3922
"									yes	no	"					"	"	3923
"	no							9 00	"	"	"					"		3924
"											"					"		3925
"									no	no	B. of B. M.	no	no	no	yes	"	yes	3926
s-mo.									"	"	"	"	"	"	"	"	"	3927
"									yes	"	None					"	"	3928
"	no							8 00	"	"	B. of B. M.	no	no	no	no	"	"	3929
"	"							7 00	"	"	"	"	"	"	"	"	"	3930
"	"							6 00	"	"	"	"	"	"	yes	"	"	3931
"									no	"	None					"	"	3932
"									yes	"	"					"	"	3933
wk.									"	"	B. of B. M.	no	no	no	yes	"	"	3934
"									no	"	"	"	"	"	"	"	"	3935
"	no							10 00	yes	yes	"	"	"	"	"	"	"	3936
"									no	no	None					"	"	3937
"	no							6 00	"	"	"					"	"	3938
"	"							16 00	"	"	"					"	"	3939
"	"							6 00	"	yes	"					"	"	3940
"	"							12 00			"					"		3941
"											"					"		3942
"	no							10 00			"					no		3943
"											"					yes		3944
"											"					"		3945
"											"					"		3946
"	no							8 00	yes	no	"					"	yes	3947
"	"							7 50	"	"	"					"	"	3948
s-mo.	yes						yes				"					"	"	3949
"											"					"	"	3950

Book No. 80. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
3951	Marshall	19	Am.	----	s	--	--	Rubber	day	10	yes	$75	30	Vacation	$212	------
3952	“	18	“	----	“	-	-	“	“	8	“	75	210	At school	77	------
3953	“	15	“	----	“	--	--	“	“	10	“	60	210	“	61	------
3954	“	20	“	----	“	-	--	“	“	10	“	1 25	21	Lack of work	365	none
3955	“	16	“	----	“	-	--	“	“	10	“	75	210	At school	77	------
3956	Charlotte	26	“	----	“	--	-	“	wk	10	“	75	90	Lack of work	167	none
3957	“	29	“	----	m	2	2	“	pc.	10	“	1 40	90	“ “	312	“
3958	“	17	“	----	s	--	--	“	“	10	no	40	100	“ “	85	“
3959	“	18	“	----	“	--	--	“	“	10	yes	40	100	“ “	55	$15
3960	Detroit	30	“	----	m	2	3	“	“	10	no	2 00	30	“ “	566	100
3961	“	23	“	----	s	--	--	“	“	10	“	1 50	90	“ “	335	none
3962	“	24	“	----	“	--	--	“	“	10	“	2 00	30	“ “	566	100
3963	“	27	“	----	“	--	--	“	“	10	“	2 00	30	“ “	566	150
3964	Ovid	16	“	----	“	--	--	“	“	10	“	75	234	At school	59	none
3965	“	46	“	----	m	2	2	“	“	10	“	1 75	52	Other work	456	“
3966	Jackson	23	“	----	“	2	1	“	day	10	yes	1 25	250	Lack of work	79	“
3967	G'd Rapids	37	Hol.	11	“	2	5	Enameler	“	10	“	1 50	78	“ “	411	“
3968	“	23	“	4	s	--	--	“	“	10	“	1 50	130	“ “	333	“
3969	“	20	Ger.	17	“	--	-	“	“	10	“	1 50	130	“ “	333	“
3970	“	19	Am.	----	“	--	--	“	“	10	“	1 25	104	“ “	310	“
3971	“	21	“	----	m	2	-	“	“	10	“	1 50	52	“ “	450	“
3972	“	35	Hol.	23	“	2	4	“	“	10	no	2 25	none	---------------	704	“
3973	“	29	Am.	----	“	2	2	“	“	10	yes	3 00	26	Pleasure	882	275
3974	“	32	“	----	“	2	1	“	“	10	“	2 00	52	Lack of work	522	none
3975	“	21	Hol.	5	s	--	--	“	“	10	“	1 50	104	“ “	314	“
3976	Marshall	35	Am.	----	m	2	2	“	“	10	“	1 50	40	“ “	410	“
3977	“	26	“	----	“	2	-	“	“	10	“	1 50	40	“ “	410	“
3978	“	19	“	----	s	--	--	“	“	10	“	1 50	none	---------------	470	100
3979	“	23	“	----	m	2	1	“	“	10	“	1 25	100	Lack of work	266	none
3980	“	33	“	----	“	2	1	“	“	10	“	1 50	none	---------------	788	353
3981	“	21	“	----	s	--	--	“	“	10	“	1 50	130	Sickness	275	------
3982	“	43	“	----	m	2	3	“	“	10	“	2 00	none	---------------	626	------
3983	Jackson	38	“	----	“	2	2	“	wk.	10	no	2 00	“	---------------	626	125
3984	“	36	Ger.	15	“	2	1	“	day	10	yes	2 00	“	---------------	626	205
3985	“	27	Am.	----	“	2	--	“	pc.	10	“	1 50	30	Lack of work	425	none
3986	Detroit	32	“	----	“	2	--	“	wk	10	“	2 25	none	---------------	704	“
3987	“	28	“	----	“	2	--	“	day	10	no	1 75	36	---------------	485	“
3988	Saginaw	22	“	----	s	--	--	“	“	10	“	2 00	125	Lack of work	376	“
3989	Ionia	36	“	----	m	2	-	Varnisher	“	10	“	1 35	20	“ “ *	319	50
3990	“	29	“	----	“	2	--	“	“	10	“	1 45	36	“ “	40[illegible]	none
3991	“	48	“	----	“	2	3	“	“	10	“	1 35	30	“ “	382	“
3992	Jackson	17	“	----	s	--	--	“	“	10	yes	84	24	“ “	243	“
3993	Ionia	30	Can.	7	m	2	2	Striper	“	10	no	1 35	14	“ “ *	404	“
3994	“	26	Am.	----	“	2	1	“	“	10	“	1 60	70	“ “ *	488	“
3995	“	25	“	----	“	2	--	“	“	10	yes	1 80	42	“ “ *	488	30
3996	“	46	“	----	“	2	--	Scroller	“	10	no	1 50	25	“ “ *	432	none
3997	“	20	“	----	“	2	--	Grainer	“	10	“	95	60	“ “	240	“
3998	Kalamazoo	30	“	----	s	--	--	Decorator	pc.	10	“	2 00	60	“ “	506	100
3999	G'd Rapids	22	“	----	“	--	--	“	“	10	yes	2 50	12	“ “	830	none
4000	Kalamazoo	23	“	----	“	--	--	Grader	day	10	no	1 65	30	“ “	467	100

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance.	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.											None					yes	yes	3951
"											"					no	"	3952
"											"					yes	"	3953
"									no	no	"					"	"	3954
"											"					"	"	3955
wk.									no	no	"					"	"	3956
"	no							$5 00			"					"	"	3957
"									no	no	"					"	no	3958
"									"	"	"					"	"	3959
s-mo.	no							12 00	yes	"	"					"	yes	3960
"									no	"	"					"	"	3961
"									"	"	"					"	"	3962
"									"	"	"					"	"	3963
"											"					"	"	3964
"	yes	yes					yes				"					"	"	3965
"	no							6 00	no	no	"					"	"	3966
"	"							6 00	"	"	"					"	"	3967
"									"	"	"					"	"	3968
"									"	"	"					"	"	3969
"									"	"	"					"	"	3970
"	no							6 00	"	"	Plumbers' Union.	no	no	yes	yes	"	"	3971
"	yes	yes					no		"	"	None					"	"	3972
wk.	no							6 00	yes	yes	"					"	"	3973
"	"							5 00	no	no	B. of B. M.	no	no	no	yes	"	"	3974
"									yes	"	None					no	no	3975
s-mo.	yes						yes		"	"	"					"	yes	3976
mo.	no							6 00	no	"	"					"	"	3977
s-mo.									"	"	"					"	"	3978
"	no							7 00	"	"	"					"	no	3979
"	yes	yes					yes				"					yes	yes	3980
"									no	yes	P. & D. I. U.	no	yes	no	ye	"	"	3981
"	yes	yes					yes		ye		None					no	"	3982
wk.	"	"					"		no	no	B. of L. F.	yes	yes	yes	yes	yes	"	3983
s-mo	"	no	mort.	$250	7	yes	"		yes	"	None					no	no	3984
wk.	no							7 00			"					yes	yes	3985
"	yes	no					yes		yes	no	Musicians' Union	yes	yes			"		3986
"	no							10 00			None					no		3987
s-mo	"							6 00	no	no	"					yes	yes	3988
"	"							4 00	yes	yes	"					"	"	3989
"	"							5 00			"					"	"	3990
"	yes	no	mort.	300	7	yes	yes		yes	no	"					"	"	3991
wk.											"					no	no	3992
s-mo.	no							5 00			"					yes	yes	3993
"	yes	no	cont	1,350	6	yes	yes		yes	no	"					"	"	3994
"	no							7 00	no	"	"					"	"	3995
"	"							6 00	yes	"	"					"	"	3996
"	"								"	"	"					"	no	3997
wk.											"					no	"	3998
s-mo.									no	no	"					yes	"	3999
wk.											Wheelm'k's Union	no	yes	no	no	"	yes	4000

Book No. 81.

Table No. 1.—Continued.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
4001	Jackson....	16	Am.	....	s	--	--	Spoke fitter	day	10	yes	$0 85	30	Holidays*....	$241	none
4002	"	18	"	....	"	..	--	" "	"	10	"	90	20	Vacation*...	264	$25
4003	Lansing....	20	"	....	"	--	--	" "	"	10	no	75	100	Lack of work	160	none
4004	"	42	Ger.	12	m	4	4	" "	"	10	"	1 25	42	" "	339	"
4005	"	47	"	9	"	2	--	Skein fitter.	"	10	"	1 35	50	" "	355	"
4006	Jackson....	25	Am.	....	s	--	--	Tester	"	10	yes	1 37	15	Sickness *....	410	"
4007	"	15	Can.	12	"	--	--	Cleaner......	wk.	10	no	.66	18	At school	197	12
4008	Lansing....	33	Am.	....	"	--	--	Box setter..	day	10	"	1 85	110	Other business*	376	150
4009	G'd Rapids.	19	"	....	"	--	--	Upholsterer	pc.	10	"	80	26	Lack of work	230	none
4010	Three Rivers.	18	"	....	"	--	--	Cushion m'k'r	"	10	"	1 25	18	Pleasure.....	375	......
4011	Wayne	26	"	....	m	2	--	Top maker.	day	10	yes	1 75	30	Lack of work	495	50
4012	Three Rivers	18	"	....	s	--	--	Core maker.	"	10	"	1 04	50	Vacation	274	......
4013	G'd Rapids.	31	"	....	m	2	--	Pedal maker.	"	10	"	1 50	60	Lack of work	438	none
4014	"	54	Prus.	40	"	2	7	Case hardener	"	10	"	1 50	12	Sickness	510	"
4015	Jackson....	25	Am.	....	s	--	--	Bed worker.	pc.	10	"	2 00	12	Pleasure	602	150
4016	G'd Rapids	16	"	....	"	--	--	Marker.....	wk.	10	no	85	none	....	266	none
4017	Lansing....	30	Can.	14	"	--	--	Mason......	day	10	"	3 00	50	Sickness*....	789	150
4018	Jackson....	23	Am.	....	"	--	--	Helper	"	10	"	1 00	6	"	307	none
4019	"	57	"	....	m	2	2	"	"	10	"	1 00	12	"	301	"
4020	"	29	"	....	s	--	--	"	"	10	"	1 50	30	Lack of work	425	"
4021	"	28	Ger.	7	m	2	1	"	"	10	"	1 50	12	" "	450	"
4022	"	26	Am.	....	s	--	--	"	"	10	"	1 25	152	" "	189	"
4023	"	28	"	....	m	2	1	"	"	10	"	1 66	18	" "	490	"
4024	"	27	"	....	s	--	--	"	"	10	....	1 50	30	" "	425	"
4025	"	17	Irish	....	"	--	--	"	"	10	no	50	none	....	157	"
4026	"	16	Am.	---	"	--	--	"	"	10	"	80	10	....	242	25
4027	"	43	Pol.	20	m	2	2	"	"	10	"	1 50	10	Lack of work	455	100
4028	"	16	Am.	....	s	--	--	"	"	10	"	75	none	....	235	none
4029	"	42	"	....	m	3	3	"	"	10	"	1 25	30	Lack of work	354	"
4030	"	19	"	....	s	--	--	"	"	10	"	1 00	none	....	313	70
4031	"	30	"	....	m	2	1	"	"	10	"	1 50	"	....	470	none
4032	"	27	Eng.	....	"	2	2	"	"	10	"	1 66	"	....	520	"
4033	"	19	Am.	....	"	2	--	"	"	10	"	1 66	6	Pleasure	510	100
4034	"	43	"	....	"	2	--	"	"	10	"	1 66	10	"	503	none
4035	"	19	"	....	s	--	--	"	"	10	"	1 50	60	Lack of work	380	"
4036	"	54	Ger.	26	m	2	9	"	"	10	"	1 25	none	....	391	"
4037	"	23	Am.	....	s	--	--	"	"	10	"	1 25	"	....	391	"
4038	"	32	"	....	m	2	2	"	"	10	"	1 50	"	....	470	75
4039	"	23	Ger.	....	s	--	--	"	pc.	10	"	1 50	"	....	470	50
4040	"	23	Am.	....	"	--	--	"	day	10	"	1 30	6	Sickness.....	399	75
4041	"	16	"	....	"	--	--	"	"	10	"	75	6	Pleasure	230	none
4042	"	35	"	....	m	2	--	"	"	10	"	1 50	none	....	470	"
4043	"	17	"	....	s	--	--	"	"	10	"	1 25	"	....	391	"
4044	"	28	Rus.	6	m	2	--	"	pc.	10	yes	1 37	60	Lack of work	348	"
4045	"	32	Swiss	6	"	2	--	"	day	10	"	1 50	18	Sickness	443	50
4046	"	35	Am.	....	"	3	--	"	"	10	"	1 25	100	Lack of work	266	none
4047	"	27	Eng.	8	s	--	--	"	"	10	"	1 25	12	" "	376	100
4048	"	30	Ger.	6	"	--	--	"	"	10	"	1 50	90	" "	335	45
4049	"	27	"	12	"	--	--	"	pc.	10	"	1 50	21	" "	438	25
4050	"	20	Am.	....	"	--	--	"	day	10	"	1 50	60	Sickness	380	200

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* And lack of work.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.									no	no	None					yes	yes	4001
"									"	"	"					"	"	4002
s-mo.									"	"	"					"	"	4003
"	no							$5 00	"	"	"					"	"	4004
"	yes	yes					yes		"	"	"					no	no	4005
wk.											"					"	"	4006
"											"					yes	yes	4007
s-mo.									yes	no	"					"	"	4008
wk.									"	"	"					"	"	4009
"											"					"	"	4010
s-mo.	no							6 00	yes	no	"					"	"	4011
wk.											"					no	no	4012
s-mo.	no							7 00	yes	no	"					yes	yes	4013
"	yes	no	mort.	$400	7	yes	yes		"	"	B. of B. M.	no	no	no	yes	"	"	4014
wk.									"	"	None					no	no	4015
"									no	"	"					"	yes	4016
"	yes	no	mort.	100	8	yes	yes			yes	"					yes	"	4017
"									no	no	"					"	"	4018
"	no							10 00	"	"	"					"	"	4019
"									"		"					"	"	4020
"	no							9 00	yes		"					no	no	4021
"	yes	yes					yes		no		"					yes	yes	4022
"	no							7 00	"		"					"	"	4023
"									"		"					"	"	4024
"									"	no	"					"	"	4025
"									"	"	"					"	"	4026
"	yes	no	mort.	200	6	yes	yes		"	"	"					no	no	4027
"									"	"	"					yes	yes	4028
"	yes	yes					yes		"	"	"					"	"	4029
"									"	"	"					"	"	4030
"	no							6 00	"	"	"					"	"	4031
"	"							6 00	"	"	"					"	"	4032
"	"							8 00	"	"	"					"	"	4033
"	yes	no	mort.	1,700	7	yes	yes		yes	"	"					"	"	4034
"									no	"	"					"	"	4035
"	yes	no	cont.	150	7	yes	yes		yes	"	"					"	"	4036
"									no	"	"					"	"	4037
"	yes	no	cont.	400	6	yes	yes		"	"	"					"	"	4038
"									yes	"	"					"	"	4039
"									no	"	"					"	"	4040
"									"	"	"					no	no	4041
"	no							7 00	"	"	"					yes	yes	4042
"									"	"	"					"	"	4043
"	no							6 00	"	"	"					"	"	4044
"	"							7 00	yes	"	"					"	"	4045
"	yes	no	mort.	300	5	yes	yes				"					"	"	4046
"									no	no	"					"	"	4047
"											"					"	"	4048
"									yes	no	"					"	"	4049
"	yes	no	cont.	500	7	yes	yes		"	"	"					"	"	4050

Book No. 82. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
4051	Jackson	42	Am.	----	m	4	1	Helper	day	10	no	$1 50	60	Lack of work	$380	none
4052	“	17	“	----	s	--	--	“	“	10	“	1 50	none	----	470	“
4053	“	18	“	----	“	--	--	“	“	10	“	1 50	“	----	470	“
4054	“	22	“	----	m	2	--	“	“	10	“	1 50	20	Sickness	440	“
4055	“	37	Ger.	---	“	2	3	“	“	10	“	1 50	6	“	461	“
4056	“	23	Am.	----	“	2	1	“	“	10	“	1 50	78	Lack of work	353	$50
4057	Charlotte	17	“	----	s	--	--	“	“	10	“	50	100	“ “	106	none
4058	“	31	“	---	m	2	1	“	pc.	10	yes	1 25	90	“ “	278	50
4059	“	19	“	----	s		--	“	“	10	no	85	90	“ “	189	none
4060	“	32	“	----	m	2	1	“	“	10	yes	1 60	90	“ “	356	“
4061	“	42	“	----	“	2	3	“	“	10	“	1 50	90	“ “	335	“
4062	“	22	“	----	“	2	--	“	“	10	“	1 25	60	“ “	316	“
4063	“	19	“	----	s	--	--	“	wk.	10	“	42	70	“ “	102	“
4064	“	32	“	----	m	2	2	“	“	10	“	1 25	60	“ “	316	100
4065	“	28	“	----	“	2	1	“	pc.	10	“	1 25	60	“ “	316	none
4066	“	36	“	----	“	2	2	“	wk.	10	“	1 25	60	“ “	316	“
4067	“	23	“	----	“	2	-	“	pc.	10	“	1 25	90	“ “ *	278	“
4068	“	18	“	----	s	--	--	“	day	10	“	67	60	“ “	169	18
4069	“	31	“	----	m	2	3	“	“	10	no	1 00	90	“ “	223	none
4070	“	24	“	---	s	--	--	“	pc.	10	yes	1 25	90	“ “ *	278	“
4071	“	26	“	----	m	2	1	“	day	10	no	1 00	90	“ “	223	“
4072	“	32	“	----	“	2	1	“	pc.	10	yes	1 40	60	“ “	354	“
4073	“	26	“	----	s	--	--	“	wk.	10	“	1 00	60	“ “	253	“
4074	“	31	Can.	8	m	2	--	“	pc.	10	“	1 75	60	“ “	443	“
4075	“	62	Am	----	w	1	3	“	“	10	“	1 25	60	“ “	316	“
4076	“	18	“	----	s	--	--	“	wk.	10	“	42	100	“ “	89	7
4077	“	18	“	----	“	--	--	“	“	10	“	42	90	“ “	93	15
4078	“	29	“	----	m	2	--	“	pc.	10	“	2 50	30	“ “	707	none
4079	“	28	“	---	“	2	1	“	wk.	10	“	1 00	80	“ “	233	“
4080	“	38	“	----	“	2	1	“	“	10	“	1 17	100	“ “	249	60
4081	“	26	“	----	s	--	--	“	pc.	10	“	1 80	90	“ “	401	none
4082	“	20	“	----	“	--	--	“	wk.	10	“	1 17	60	“ “ *	382	60
4083	“	23	“	----	m	2	1	“	day	10	“	1 25	20	“ “	366	none
4084	“	31	“	----	“	2	--	“	wk.	10	“	1 25	60	“ “	316	100
4085	Detroit	16	“	----	s	--	--	“	day	10	no	65	6	Sickness	200	none
4086	“	18	“	----	“	--	--	“	“	10	“	1 25	7	Pleasure	382	50
4087	“	17	“	----	“	--	--	“	“	10	“	67	none	----	209	none
4088	“	16	“	----	“	--	--	“	“	10	“	50	156	At school	78	“
4089	“	18	“	----	“	--	--	“	“	10	“	75	26	Pleasure	215	“
4090	“	16	“	----	“	--	--	“	“	10	yes	50	none	----	156	“
4091	“	17	“	---	“	--	--	“	“	10	no	75	130	Lack of work	137	“
4092	“	17	“	----	“	--	--	“	“	10	“	50	78	“ “	118	“
4093	“	18	“	---	“	--	--	“	“	10	“	75	130	“ “	137	“
4094	“	20	“	----	“	--	--	“	“	10	“	1 00	30	“ “	283	“
4095	“	16	“	---	“	--	--	“	“	10	“	1 00	none	----	318	150
4096	“	17	“	----	“	--	--	“	wk.	10	----	75	“	----	235	----
4097	“	23	Can.	2	“	--	--	“	day	10	----	1 25	“	----	391	----
4098	“	16	Ger.	14	“	--	--	“	“	10	no	50	26	Sickness	144	none
4099	“	27	Am.	----	m	2	1	“	“	10	“	1 50	30	Lack of work	425	“
4100	“	25	“	----	s	--	--	“	“	10	“	1 50	60	“ “	380	“

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	yes	no	mort.	$600	7	yes	yes	---	no	no	None	---	---	---	---	yes	yes	4051
“	---	---	---	---	---	---	---	---	“	“	“	---	---	---	---	“	“	4052
“	---	---	---	---	---	---	---	---	“	“	“	---	---	---	---	“	“	4053
“	no	---	---	---	---	---	---	---	“	“	“	---	---	---	---	“	“	4054
“	yes	no	mort.	100	7	yes	yes	---	“	“	“	---	---	---	---	no	no	4055
s-mo.	no	---	---	---	---	---	---	$3 00	---	---	“	---	---	---	---	yes	“	4056
wk.	---	---	---	---	---	---	---	---	no	no	“	---	---	---	---	“	“	4057
“	yes	yes	---	---	---	---	yes	---	yes	yes	“	---	---	---	---	“	yes	4058
“	---	---	---	---	---	---	---	---	no	no	“	---	---	---	---	“	“	4059
“	no	---	---	---	---	---	---	6 00	“	“	“	---	---	---	---	“	“	4060
“	yes	yes	---	---	---	---	yes	---	yes	“	“	---	---	---	---	“	“	4061
“	“	no	mort.	75	7	no	no	---	no	“	“	---	---	---	---	“	“	4062
“	---	---	---	---	---	---	---	---	---	---	“	---	---	---	---	“	no	4063
“	yes	no	mort.	225	7	yes	yes	---	yes	no	“	---	---	---	---	“	yes	4064
“	no	---	---	---	---	---	---	7 00	no	“	“	---	---	---	---	“	“	4065
“	“	---	---	---	---	---	---	7 00	yes	“	“	---	---	---	---	“	“	4066
“	“	---	---	---	---	---	---	6 00	“	“	“	---	---	---	---	“	“	4067
“	---	---	---	---	---	---	---	---	no	“	“	---	---	---	---	“	“	4068
“	no	---	---	---	---	---	---	5 00	“	“	“	---	---	---	---	“	“	4069
“	---	---	---	---	---	---	---	---	yes	yes	“	---	---	---	---	“	“	4070
“	no	---	---	---	---	---	---	4 00	“	“	“	---	---	---	---	“	“	4071
“	“	---	---	---	---	---	---	5 50	“	“	“	---	---	---	---	“	“	4072
“	---	---	---	---	---	---	---	---	no	no	“	---	---	---	---	“	“	4073
“	no	---	---	---	---	---	---	6 00	yes	“	“	---	---	---	---	no	no	4074
“	yes	yes	---	---	---	---	yes	---	no	“	“	---	---	---	---	yes	yes	4075
“	---	---	---	---	---	---	---	---	---	---	“	---	---	---	---	“	“	4076
“	---	---	---	---	---	---	---	---	no	no	“	---	---	---	---	“	“	4077
“	no	---	---	---	---	---	---	8 00	“	“	“	---	---	---	---	no	no	4078
“	“	---	---	---	---	---	---	6 00	---	---	“	---	---	---	---	yes	“	4079
“	yes	no	mort.	50	7	yes	yes	---	---	yes	“	---	---	---	---	“	“	4080
“	---	---	---	---	---	---	---	---	yes	“	“	---	---	---	---	“	yes	4081
“	---	---	---	---	---	---	---	---	---	“	“	---		---	---	“	no	4082
“	yes	no	cont.	175	7	yes	yes	---	yes	“	“	---	---	---	---	“	“	4083
“	“	yes	---	---	---	---	“	---	“	“	“	---	---	---	---	“	“	4084
“	---	---	---	---	---	---	---	---	---	---	“	---	---	---	---	“	---	4085
“	---	---	---	---	---	---	---	---	---	---	“	---	---	---	---	no	---	4086
“	---	---	---	---	---	---	---	---	---	---	“	---	---	---	---	yes	---	4087
“	---	---	---	---	---	---	---	---	---	---	“	---	---	---	---	“	---	4088
“	---	---	---	---	---	---	---	---	---	---	“	---	---	---	---	“	---	4089
“	---	---	---	---	---	---	---	---	---	---	“	---	---	---	---	“	---	4090
“	---	---	---	---	---	---	---	---	---	---	“	---	---	---	---	“	---	4091
“	---	---	---	---	---	---	---	---	---	---	“	---	---	---	---	“	---	4092
“	---	---	---	---	---	---	---	---	---	---	“	---	---	---	---	“	---	4093
“	---	---	---	---	---	---	---	---	no	no	“	---	---	---	---	“	yes	4094
“	---	---	---	---	---	---	---	---	---	---	“	---	---	---	---	“	no	4095
“	---	---	---	---	---	---	---	---	---	---	“	---	---	---	---	“	yes	4096
“	---	---	---	---	---	---	---	---	---	---	“	---	---	---	---	“	“	4097
“	---	---	---	---	---	---	---	---	---	---	“	---	---	---	---	“	“	4098
s-mo.	no	---	---	---	---	---	---	8 00	yes	no	“	---	---	---	---	“	“	4099
“	---	---	---	---	---	---	---	---	no	“	“	---	---	---	---	“	“	4100

Book No. 83. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
4101	Detroit -----	24	Am.	----	s	--	--	Helper ------	day	10	no	$1 50	60	Lack of work	$380	none
4102	“ -----	30	Ger.	6	m	2	3	“ ------	“	10	“	1 25	90	“ “	279	“
4103	“ -----	21	Can.	10	s	--	--	“ ------	“	10	“	1 00	90	“ “	223	“
4104	“ -----	21	Am.	----	“	--	--	“ ------	“	10	“	1 00	30	Sickness ------	283	“
4105	“ -----	35	“	----	m	2	5	“ ------	“	10	yes	1 66	6	Vacation ----	512	------
4106	“ -----	35	“	----	“	2	2	“ ------	“	10	“	1 66	3	“ ----	517	$60
4107	“ -----	23	“	----	s	--	--	“ ------	“	10	no	1 50	30	Lack of work	425	none
4108	“ -----	29	“	----	“	--	--	“ ------	“	10	“	1 50	120	“ “	290	“
4109	“ -----	45	“	----	m	2	4	“ ------	“	10	“	1 50	none	----------------	470	“
4110	“ -----	37	Fr.	----	“	2	4	“ ------	wk.	10	“	1 67	6	Holidays -----	503	“
4111	“ -----	26	Hol.	5	s	--	--	“ ------	day	10	“	1 50	none	----------------	470	“
4112	“ -----	39	Ger.	14	m	2	2	“ ------	“	10	“	1 50	“	----------------	470	“
4113	“ -----	17	“	3	s	--	--	“ ------	wk.	10	“	67	“	----------------	210	50
4114	G'd Rapids.	18	Am.	----	“	--	--	“ ------	“	----	“	85	182	Lack of work	109	none
4115	“	64	Hol.	14	w	1	1	“ ------	day	10	“	90	130	“ “	165	“
4116	“	23	Ger.	8	s	--	--	“ ------	“	10	“	1 00	42	“ “	271	“
4117	“	49	Hol.	23	m	2	6	“ ------	“	10	“	1 10	52	“ “	287	“
4118	“	30	“	8	s	--	--	“ ------	“	10	yes	1 25	60	“ “	316	“
4119	“	16	Am.	----	“	--	--	“ ------	“	10	no	50	26	“ “	144	“
4120	“	38	Pol.	11	m	2	5	“ ------	“	10	“	1 10	78	“ “	235	“
4121	“	35	Swe.	14	“	2	2	“ ------	“	10	yes	1 50	none	----------------	490	75
4122	Lansing ----	25	Ger.	24	s	--	--	“ ------	“	10	no	1 00	45	Lack of work	268	none
4123	“ ----	37	“	13	m	2	2	“ ------	“	10	“	1 20	82	“ “	277	“
4124	“ ----	25	“	2	“	2	--	“ ------	“	10	“	1 50	41	“ “	405	“
4125	“ ----	24	Am.	----	“	2	1	“ ------	“	10	“	1 00	50	“ “	263	“
4126	“ ----	67	“	----	“	3	--	“ ------	“	10	“	1 00	156	“ “	157	“
4127	“ ----	28	“	----	“	2	2	“ ------	“	10	“	1 25	50	“ “	329	“
4128	“ ----	35	“	----	“	2	1	“ ------	“	10	“	1 25	50	“ “	329	“
4129	“ ----	18	“	----	s	--	--	“ ------	“	10	“	70	30	“ “	198	“
4130	“ ----	44	“	----	m	2	1	“ ------	“	10	“	1 00	60	“ “	253	“
4131	“ ----	56	“	----	“	2	2	“ ------	“	10	“	1 00	200	“ “	113	“
4132	“ ----	26	“	----	s	--	--	“ ------	pc.	10	yes	1 35	18	“ “	398	“
4133	Ionia -------	31	“	----	w	1	1	“ ------	day	10	no	1 20	30	“ “	340	“
4134	“ -------	17	“	----	s	--	--	“ ------	“	10	“	75	60	“ “	190	“
4135	“ -------	50	“	----	m	3	2	“ ------	“	10	“	1 09	39	Sickness ------	299	“
4136	“ -------	21	“	----	s	--	--	“ ------	“	10	“	78	70	Lack of work	190	100
4137	Three Rivers	18	“	----	“	--	--	“ ------	“	10	“	85	none	----------------	266	------
4138	“ “	18	“	----	“	--	--	“ ------	wk.	10	yes	75	“	----------------	235	none
4139	“ “	17	“	----	“	--	--	“ ------	day	10	no	75	“	----------------	235	“
4140	“ “	20	“	----	“	--	--	“ ------	“	10	“	75	12	Lack of work	226	“
4141	“ “	38	“	----	m	2	1	“ ------	“	10	yes	1 00	40	“ “ *	273	“
4142	“ “	53	“	----	“	2	2	“ ------	“	10	no	96	15	“ “	286	“
4143	Wayne -----	19	“	----	s	--	--	“ ------	“	10	yes	75	90	“ “	167	“
4144	“ -----	16	“	----	“	--	--	“ ------	“	10	“	75	60	“ “	200	------
4145	“ -----	17	“	----	“	--	--	“ ------	“	10	no	50	60	“ “	127	none
4146	Flint -------	19	Can.	18	“	--	--	“ ------	“	10	yes	1 12	40	Vacation ----	307	“
4147	“ -------	16	Am.	----	“	--	--	“ ------	“	10	no	50	none	----------------	156	50
4148	“ -------	16	“	----	“	--	--	“ ------	wk.	10	“	1 00	25	Lack of work	288	none
4149	“ -------	24	“	----	“	--	--	“ ------	day	10	“	1 00	8	“ “	305	“
4150	“ -------	34	Can.	18	“	--	--	“ ------	“	10	“	1 25	100	Vacation ----	266	“

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* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.									no	no	None					yes	yes	4101
"	no							$6 00	"	"	"					"	"	4102
"											"					"	"	4103
"									no	no	"					"	"	4104
wk.	yes	no	mort.	$850	6	yes	yes		"	"	"					"	"	4105
"	"	yes					"		"	"	"					no	no	4106
s-mo.									"	"	"					yes	yes	4107
"											"					"	"	4108
"	no							8 00	no	no	"					"	"	4109
wk.	yes	yes					yes		"	"	"					"	no	4110
"											"					"	yes	4111
s-mo.	yes	yes					yes		yes	no	"					"	no	4112
wk.									no	"	"					no	"	4113
"									"	"	"					yes	yes	4114
"	yes	no	mort.	25	8	yes	yes		"	"	"					"	"	4115
"									"	"	"					"	"	4116
"	yes	no	mort.	200	7	yes	yes		"	"	"					"	"	4117
"									"	"	"					"	no	4118
"									"	"	"					"	yes	4119
"	no							2 50	"	"	"					"	"	4120
"	"							6 00	yes	"	"					"	"	4121
s-mo.									no	"	"					"	"	4122
"	yes	no	mort.	400	7	no	yes		yes	"	"					no	no	4123
"	no							5 00	"	"	"					"	"	4124
"	"							4 00	no	"	"					yes	yes	4125
"	"							7 00	yes	"	"					"	"	4126
"	"							6 00	no	"	"					"	"	4127
"	"							6 00	yes	"	"					"	"	4128
"											"					"	"	4129
wk.	yes	no	cont.	500	6	yes	yes		yes	no	"					"	"	4130
"	"	yes					"		no	"	"					"	"	4131
"									yes	yes	"					"	"	4132
s-mo.	no							16 00	no	no	"					"	"	4133
"	"							8 00	yes	"	"					"	"	4134
"	"								no	"	"					"	"	4135
"									"	"	"					"	"	4136
wk.									yes		"					"	"	4137
"											"					"		4138
"											"					"	yes	4139
											"					"	"	4140
wk.	no							5 00	yes	no	"					"	"	4141
"	"								"		"					"	"	4142
s-mo.											"					"	"	4143
"											"					"	"	4144
"											"					"	"	4145
"	yes	yes					no		no	no	"					"	"	4146
wk.									"	"	"					"	no	4147
"									"	"	"					no	"	4148
"									yes	"	"					yes	yes	4149
s-mo.									"	"	"					"	"	4150

Book No. 84. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
4151	Kalamazoo.	30	Irish	11	s	--	--	Helper -----	day	10	----	$1 25	156	Lack of work	$196	none
4152	"	16	Am.	----	"	--	--	" -----	"	10	no	50	40	" "	137	"
4153	"	27	"	----	"	--	--	" -----	"	10	----	1 25	160	" "	191	"
4154	"	21	"	----	"	--	--	" -----	"	10	no	1 25	90	" "	279	"
4155	"	22	Hol.	----	"	--	--	" -----	"	10	"	1 50	30	" "	425	"
4156	"	22	"	----	"	--	--	" -----	"	10	"	1 25	120	" "	241	"
4157	"	25	Am.	----	"	--	--	" -----	"	10	"	1 25	200	" "	141	"
4158	"	28	Irish	----	m	2	2	" -----	"	10	----	1 25	105	" "	260	"
4159	"	22	"	18	s	--	--	" -----	"	10	----	1 10	75	" "	261	"
4160	Pontiac ----	14	Am.	----	"	--	--	" -----	"	10	no	60	235	----------------	47	------
4161	" ----	60	"	----	m	2	4	" -----	"	10	"	1 00	30	Lack of work*	283	none
4162	" ----	16	"	----	s	--	--	" -----	"	10	"	1 00	75	" "	283	"
4163	" ----	20	"	----	m	2	--	" -----	"	10	"	1 25	24	" "	361	$100
4164	" ----	21	"	----	s	--	--	" -----	"	10	"	1 25	15	" " *	374	none
4165	Marshall ---	18	"	----	"	--	--	" -----	"	10	----	1 00	none	----------------	313	50
4166	" ---	17	"	----	"	--	--	" -----	"	10	yes	50	"	----------------	127	none
4167	" ---	20	"	----	"	--	--	" -----	"	10	no	1 00	60	Lack of work	253	"
4168	" ---	16	"	----	"	--	--	" -----	"	10	"	60	10	Vacation ----	182	------
4169	Ovid--------	16	Can.	4	"	--	--	" -----	"	10	"	85	182	Other work--	111	none
4170	" --------	46	Irish	25	m	2	3	" -----	"	10	"	1 50	150	" " --	244	"
4171	" --------	18	Can.	----	s	--	--	" -----	"	10	"	75	234	Other business	58	------
4172	White Pigeon	50	Am.	----	m	2	--	" -----	"	10	"	1 00	60	Lack of work	253	none
4173	" "	19	"	----	s	--	--	" -----	"	10	"	75	60	" "	190	"
4174	Bay City ---	18	"	----	"	--	--	" -----	"	10	"	75	18	Sickness -----	221	"
4175	Buchanan--	22	"	----	"	--	--	" -----	"	10	"	1 25	30	Various------	316	------
4176	Coldwater--	15	Ger.	14	"	--	--	" -----	"	10	yes	50	120	Lack of work	97	none
4177	Plymouth --	55	Am.	----	m	2	1	" -----	"	10	no	1 25	90	" " *	279	"
4178	Linden -----	16	"	----	s	--	--	" -----	"	10	"	1 00	110	" "	203	"
4179	Manistee ---	33	"	----	m	2	5	" -----	"	10	"	1 00	104	" "	209	"
4180	Owosso------	17	"	----	s	--	--	" -----	"	8	"	80	50	" "	210	"
4181	G'd Rapids-	17	Pol.	----	"	--	--	Apprentice -	wk	10	"	67	213	At school-----	67	"
4182	"	17	Am.	----	"	--	--	"	day	10	yes	50	104	Lack of work	104	"
4183	"	18	"	----	"	--	--	"	wk.	10	no	50	182	" "	65	"
4184	"	28	Ger.	26	"	--	--	"	day	10	"	1 50	18	" "	443	"
4185	"	15	Am.	----	"	--	--	"	wk.	10	"	50	none	----------------	156	"
4186	"	18	"	----	"	--	--	"	"	10	"	67	156	Lack of work	105	"
4187	"	18	"	----	"	--	--	"	"	10	"	83	78	Sickness -----	195	"
4188	"	16	Pol.	8	"	--	--	"	"	10	"	83	26	Lack of work	238	"
4189	"	17	Am.	----	"	--	--	"	"	10	"	83	none	----------------	260	"
4190	"	16	Ger.	6	"	--	--	"	"	10	"	60	"	----------------	188	"
4191	"	16	Pol.	15	"	--	--	"	"	10	yes	60	26	Sickness -----	172	"
4192	"	21	Am.	----	"	--	--	"	day	10	"	80	18	" -----	267	50
4193	"	18	Can.	----	"	--	--	"	"	10	"	80	12	Pleasure-----	272	50
4194	"	18	Am.	----	"	--	--	"	"	10	"	80	18	Sickness -----	267	10
4195	"	17	"	----	"	--	--	"	"	10	"	70	6	" -----	243	none
4196	"	18	"	----	"	--	--	"	"	10	"	1 00	78	Lack of work	274	"
4197	"	18	"	----	"	--	--	"	"	10	"	90	12	Pleasure -----	306	50
4198	"	18	"	----	"	--	--	"	"	10	"	60	130	Lack of work	133	none
4199	"	17	Eng.	5	"	--	--	"	"	10	"	1 00	6	Pleasure -----	346	45
4200	"	17	Am.	----	"	--	--	"	"	10	"	80	none	----------------	282	25

* And sickness

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	----	----	----	----	----	----	----	----	----	----	None	----	----	----	----	no	no	4151
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4152
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	yes	yes	4153
"	----	----	----	----	----	----	----	----	----	----	C. & W. M. U.	---	----	----	yes	"	"	4154
mo.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	"	"	"	4155
wk.	----	----	----	----	----	----	----	----	----	----	None	----	----	----	----	no	no	4156
"	----	----	----	----	----	----	----	----	no	no	C. & W. M. U.	no	no	no	yes	yes	yes	4157
"	no	----	----	----	----	----	----	$6 00	----	----	None	----	----	----	----	"	"	4158
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	no	4159
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	yes	4160
"	no	----	----	----	----	----	----	12 00	yes	no	"	----	----	----	----	"	"	4161
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	no	"	4162
"	no	----	----	----	----	----	----	6 00	----	----	"	----	----	----	----	yes	"	4163
"	----	----	----	----	----	----	----	----	yes	----	"	----	----	----	----	"	"	4164
s-mo.	----	----	----	----	----	----	----	----	----	----	"	---	----	----	----	----	----	4165
"	----	----	----	----	----	----	----	----	no	----	"	----	----	----	----	yes	----	4166
wk.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	4167
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	yes	4168
s-mo.	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	4169
"	yes	yes	----	----	----	----	yes	----	----	----	"	---	----	----	----	"	"	4170
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	4171
"	yes	no	----	----	----	----	no.	----	"	----	"	----	----	----	----	"	"	4172
----	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4173
wk.	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	4174
s-mo.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	no	"	4175
wk.	----	----	----	----	----	----	----	----	no	no	"	---	----	----	----	yes	"	4176
"	yes	no	----	----	----	----	yes	----	----	---	"	----	----	----	----	----	----	4177
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	yes	yes	4178
"	no	----	----	----	----	----	----	5 00	----	----	"	---	----	----	----	"	"	4179
"	----	----	----	----	----	----	----	----	yes	no	"	---	----	----	----	"	"	4180
"	----	----	----	----	----	----	----	----	no	yes	"	---	----	----	----	no	"	4181
"	----	----	----	----	----	----	----	----	yes	no	"	---	----	----	----	yes	"	4182
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	4183
"	----	----	----	----	----	----	----	----	----	----	Metal Pol. Union	no	no	yes	yes	"	"	4184
"	----	----	----	----	----	----	----	----	no	no	None	----	----	----	----	"	"	4185
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4186
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4187
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4188
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4189
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4190
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	no	no	4191
s-mo.	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	yes	"	4192
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	yes	4193
"	----	----	----	----	----	----	----	----	"	"	"	---	----	----	----	"	"	4194
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4195
"	----	----	----	----	----	----	----	----	yes	"	"	----	----	----	----	"	"	4196
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	no	4197
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4198
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	yes	4199
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4200

Book No. 85. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
4201	G'd Rapids.	16	Am.	----	s	--	--	Apprentice.	day	10	yes	$0 60	none	----------------	$211	none
4202	"	20	"	----	"	--	--	"	"	10	"	1 25	78	Lack of work	343	"
4203	"	20	"	----	"	--	--	"	"	10	"	1 00	208	" "	144	"
4204	"	17	Hol.	11	"	--	--	"	"	10	no	50	none	----------------	157	"
4205	"	17	Am.	----	"	--	--	"	"	10	"	50	78	Lack of work*	118	"
4206	"	16	"	----	"	--	--	"	wk.	10	"	50	none	----------------	157	"
4207	"	14	"	----	"	--	--	"	"	10	"	50	"	----------------	157	"
4208	"	17	"	----	"	--	--	"	day	10	"	75	52	Lack of work	196	"
4209	"	17	"	----	"	--	--	"	"	10	"	1 25	36	Sickness*----	346	"
4210	"	17	"	----	"	--	--	"	wk.	10	"	66	39	Lack of work	183	$25
4211	"	17	"	----	"	--	--	"	"	10	"	92	6	Sickness -----	282	none
4212	"	18	"	----	"	--	--	"	"	10	"	66	78	Lack of work	155	"
4213	"	17	"	----	"	--	--	"	day	10	"	1 00	6	Sickness*----	307	"
4214	"	17	"	----	"	--	--	"	"	10	"	50	none	----------------	157	"
4215	"	20	Pol.	12	"	--	--	"	"	10	"	1 00	104	Lack of work	209	"
4216	"	19	"	16	"	--	--	"	wk.	10	yes	66	26	" "	194	"
4217	"	17	Am	----	"	--	--	"	"	10	"	66	36	" "	187	"
4218	"	20	"	----	"	--	--	"	"	10	no	90	12	" "	271	"
4219	"	16	Hol.	4	"	--	--	"	day	10	yes	60	6	" "	191	"
4220	Buchanan--	20	Am.	----	"	--	--	"	"	10	no	87	27	Various-----	249	------
4221	" --	21	"	----	"	--	--	"	pc.	10	"	1 00	28	" ------	285	------
4222	" --	20	"	----	"	--	--	"	day	10	"	1 12	29	" ------	318	------
4223	" --	16	"	----	"	--	--	"	"	10	"	75	27	" ------	214	------
4224	Saginaw, E. S.	18	"	----	"	--	--	"	mo.	10	yes	38	none	----------------	120	none
4225	"	20	"	----	"	--	--	"	"	10	"	50	12	Pleasure -----	150	"
4226	" W. S	17	"	----	"	--	--	"	wk.	10	"	33	none	----------------	104	"
4227	"	16	"	----	"	--	--	"	day	10	"	75	"	----------------	235	"
4228	Wayne------	17	"	----	"	--	--	"	"	10	"	50	30	Lack of work	142	------
4229	" ------	17	"	----	"	--	--	"	"	10	no	75	3	Sickness ----	233	none
4230	" ------	18	"	----	"	--	--	"	"	10	"	75	90	Lack of work	167	"
4231	Lansing----	17	"	----	"	--	--	"	"	10	"	50	15	" "	151	"
4232	" ----	18	"	----	"	--	--	"	"	10	"	50	12	" "	151	"
4233	" ----	21	"	----	m	2	--	"	"	10	"	75	10	" " †	227	"
4234	Detroit-----	16	Ger.	----	s	--	--	"	wk.	10	"	83	7	Holidays-----	254	"
4235	G'd Rapids.	39	Am.	----	"	--	--	Elevator ---	day	10	"	75	130	Lack of work	137	"
4236	Lansing----	52	Ger.	13	m	4	2	" ---	"	10	"	1 25	53	" "	325	"
4237	Detroit-----	21	Am.	--	s	--	--	Porter------	wk.	10	"	1 00	none	----------------	313	"
4238	" -----	30	Can.	18	m	2	--	Various work.	day	10	"	2 00	"	----------------	626	200
4239	" -----	19	Ger.	15	"	2	--	" "	"	10	yes	1 00	14	Lack of work	300	none
4240	" -----	25	"	24	"	2	--	" "	"	10	"	1 75	none	----------------	600	250
4241	" -----	44	"	37	"	2	3	" "	pc.	10	----	1 59	"	----------------	497	------
4242	" -----	--	Eng.	4	"	2	1	" "	day	10	----	1 50	"	----------------	470	none
4243	" -----	28	Am.	----	"	2	1	" "	pc.	10	no	2 00	60	Lack of work†	506	"
4244	" -----	20	"	----	"	--	--	" "	day	9	----	1 00	none	----------------	313	"
4245	Jackson ----	42	"	----	"	2	--	" "	"	10	yes	1 60	42	Lack of work	434	"
4246	" ----	29	"	----	s	--	--	" "	"	10	----	1 25	10	----------------	379	------
4247	" ----	23	"	----	m	2	1	" "	"	10	yes	2 00	4	Holidays-----	618	none
4248	" ----	21	"	----	s	--	--	" "	"	10	"	1 25	150	Lack of work	204	45
4249	Saginaw, W. S.	21	"	----	"	2	3	" "	"	10	no	1 00	1	Sickness -----	312	none
4250	"	21	"	----	m	2	--	" "	"	10	yes	2 00	12	Holidays ----	602	"

---

* And pleasure.
† And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.	----	----	----	----	----	----	----	----	no	no	None	----	----	----	----	yes	no	4201
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	yes	4202
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4203
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4204
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4205
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4206
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4207
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4208
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4209
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4210
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4211
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4212
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	no	4213
wk.	----	----	----	----	----	----	----	----	"	yes	"	----	----	----	----	"	yes	4214
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	no	"	4215
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	yes	"	4216
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4217
"	----	----	----	----	----	----	----	----	"	no	"	----	----	----	----	"	"	4218
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4219
s-mo.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4220
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4221
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4222
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4223
mo.	yes	yes	----	----	----	----	yes	----	----	----	"	----	----	----	----	"	"	4224
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	no	"	4225
wk.	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	yes	no	4226
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	yes	4227
s-mo.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4228
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4229
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4230
wk.	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	4231
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4232
"	no	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4233
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4234
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4235
s-mo.	yes	no	mort.	$300	8	no	yes	----	yes	"	"	----	----	----	----	no	no	4236
wk.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4237
"	yes	no	mort.	700	5	yes	yes	----	----	----	"	----	----	----	----	yes	----	4238
"	no	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	4239
"	"	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	4240
"	yes	yes	----	----	----	----	yes	----	yes	no	"	----	----	----	----	no	no	4241
"	no	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4242
s-mo.	"	----	----	----	----	----	----	$10 00	no	no	"	----	----	----	----	yes	yes	4243
"	"	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4244
wk.	yes	yes	----	----	----	----	yes	----	yes	yes	"	----	----	----	----	"	no	4245
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	yes	4246
"	no	----	----	----	----	----	----	8 00	----	----	"	----	----	----	----	"	"	4247
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4248
s-mo.	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	4249
"	no	----	----	----	----	----	----	9 00	"	"	"	----	----	----	----	"	"	4250

Book No. 86. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
4251	Saginaw, E. S.	19	Ger.	11	s	--	--	Various work	day	10	yes	$1 50	6	Sickness -----	$460	none
4252	Saginaw, W. S	20	Am.	----	"	--	--	" "	"	10	"	1 00	none	----------------	313	"
4253	Lowell -----	19	"	----	"	--	--	" "	"	10	no	1 00	100	Lack of work	213	"
4254	" -----	33	"	----	m	2	3	" "	"	10	"	1 25	130	" "	229	"
4255	" -----	19	"	----	s	--	--	" "	"	10	"	84	60	" "	213	"
4256	" -----	75	"	----	m	2	2	" "	"	10	----	1 00	120	" "	193	"
4257	Buchanan --	32	"	----	s	--	--	" "	"	10	no	1 37	39	Various ------	375	------
4258	" --	26	"	----	"	--	--	" "	"	10	"	1 25	33	" ------	350	------
4259	" --	36	"	----	m	2	--	" "	pc.	10	"	1 25	25	" ------	360	------
4260	Flint -----	63	"	----	"	2	4	" "	day	10	"	1 00	4	Sickness -----	309	none
4261	" --------	23	"	---	"	2	1	" "	pc.	10	"	1 50	90	Lack of work	334	$50
4262	G'd Rapids.	33	"	----	"	2	--	" "	"	10	yes	3 00	none	----------------	1,032	350
4263	"	20	Can.	5	s	--	--	" "	day	10	"	1 40	104	Lack of work	347	none
4264	Lansing ----	39	Am.	----	m	2	3	" "	"	10	no	1 21	75	" "	288	"
4265	" ----	37	Ger.	12	"	2	7	" "	"	10	"	1 20	20	Sickness -----	352	"
4266	Northville --	33	Am.	----	"	2	3	" "	"	10	"	1 15	52	Lack of work	300	"
4267	" --	32	Scot.	----	"	2	1	" "	"	10	yes	1 15	6	Sickness -----	353	100
4268	Pontiac ----	24	Eng.	----	"	2	-	" "	pc.	10	no	1 25	40	Lack of work	341	none
4269	" ----	21	Am.	----	s	--	--	" "	day	10	"	1 00	none	----------------	313	"
4270	Rochester --	31	"	----	"	--	--	" "	"	10	"	1 00	103	Lack of work	210	"
4271	" --	23	"	---	m	2	--	" "	"	10	"	1 00	157	" "	156	"
4272	Three Rivers	52	"	----	"	3	1	" "	"	10	"	1 50	25	" " *	432	100
4273	" "	55	"	---	"	4	--	" "	"	10	"	1 18	15	" "	352	none
4274	Allegan -----	33	"	----	"	2	2	" "	wk.	10	"	1 50	40	Pleasure* ----	410	"
4275	Bay City ---	33	Can.	26	"	2	3	" "	day	10	"	1 50	90	Lack of work	335	"
4276	Ionia --------	25	Am.	----	"	2	--	" "	"	10	"	1 50	12	Sickness -----	452	100
4277	Kalamazoo.	33	"	----	s	--	--	" "	"	10	---	1 60	30	Lack of work	283	none
4278	Marshall ----	21	Ger.	----	"	--	--	" "	"	10	no	1 25	156	" "	199	"
4279	Ovid --------	19	Am.	----	"	--	--	" "	pc.	10	"	1 25	120	Other work --	242	"
4280	Traverse City	45	"	----	m	2	4	" "	"	10	"	1 65	24	Sickness -----	476	------
4281	Wayne ------	34	"	----	"	2	3	" "	day	10	yes	75	none	----------------	235	none
4382	Kalamazoo.	20	"	----	s	--	--	Office girl --	"	10	----	1 50	"	----------------	370	110
4283	"	24	"	----	"	--	--	" " --	"	9	no	1 00	"	----------------	313	100
4284	"	21	"	----	"	--		" " --	"	10	----	1 50	"	----------------	470	50
4285	"	24	"	---	"	--	--	" " --	"	8	no	1 25	10	Lack of work	379	150
4286	"	16	"	---	"	--	--	Office boy --	"	10	"	75	none	----------------	235	none
4287	Pontiac ----	15	"	----	"	--	--	" " --	"	10	"	85	210	At school ----	88	"
4288	Detroit -----	18	"	----	"	--	--	" " --	"	10	"	75	78	Lack of work	176	"
4289	Flint -------	16	"	----	"	--	--	" " --	wk.	10	"	50	none	----------------	156	"
4290	Detroit -----	16	"	---	"	--	--	" " --	day	10	"	50	90	At school ----	112	------
4291	G'd Rapids.	16	"	----	"	--	--	" " --	wk.	10	yes	50	none	----------------	176	------
4292	Flint -------	18	"	----	"	--	--	" " --	"	10	"	81	"	----------------	264	50
4293	G'd Rapids.	17	Ger.	7	"	--	--	" " --	"	10	no	60	52	Lack of work	157	none
4294	Detroit -----	52	Can.	5	m	2	--	Duster ------	pc.	10	"	2 00	100	" "	426	"
4295	Marshall ---	23	Am.	----	s	--		" ------	day	10	yes	1 00	50	" "	263	"
4296	Jackson ----	18	Irish	----	"	--	--	Sweeper ----	"	10	no	75	6	Sickness -----	230	"
4297	"	17	Am.	----	"	--	--	" ----	"	10	"	50	12	Lack of work	151	"
4298	"	16	"	----	"	--	--	" ----	"	10	"	50	12	" "	151	"
4299	Lansing ----	38	"	----	m	2	2	Yardman ---	"	10	"	1 38	100	" " *	294	"
4300	" ----	61	"	----	"	3	--	" ---	"	10	"	1 00	100	" "	213	"

* And sickness.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance.	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	----	----	----	----	----	----	----	----	yes	----	None	----	----	----	----	no	no	4251
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	yes	yes	4252
mo.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4253
"	no	----	----	----	----	----	----	$4 00	yes	----	"	----	----	----	----	"	"	4254
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4255
"	yes	yes	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4256
s-mo.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4257
"	yes	no	----	$400	----	yes	yes	----	----	----	"	----	----	----	----	"	"	4258
"	"	"	----	300	7	"	"	----	yes	----	"	----	----	----	----	"	"	4259
wk.	"	"	----	----	----	----	"	----	no	no	"	----	----	----	----	"	no	4260
"	no	----	----	----	----	----	----	7 00	yes	"	"	----	----	----	----	"	yes	4261
s-mo.	"	----	----	----	----	----	----	6 00	"	"	B. of B. M.	no	no	no	yes	"	"	4262
"	----	----	----	----	----	----	----	----	no	"	None	----	----	----	----	"	"	4263
"	no	----	----	----	----	----	----	6 00	"	"	"	----	----	----	----	"	"	4264
wk.	yes	no	cont.	700	6	yes	yes	----	yes	"	"	----	----	----	----	"	"	4265
"	no	----	----	----	----	----	----	6 00	----	----	"	----	----	----	----	"	"	4266
"	yes	no	cont.	240	7	yes	yes	----	----	----	"	----	----	----	----	"	"	4267
"	"	"	----	----	----	----	"	----	no	no	"	----	----	----	----	"	"	4268
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	no	4269
"	no	----	----	----	----	----	----	4 00	----	----	"	----	----	----	----	"	yes	4270
"	"	----	----	----	----	----	----	3 00	yes	no	"	----	----	----	----	"	"	4271
"	yes	yes	----	----	----	----	yes	----	"	"	"	----	----	----	----	"	"	4272
"	"	"	----	----	----	----	"	----	no	"	"	----	----	----	----	"	"	4273
"	no	----	----	----	----	----	----	----	yes	yes	"	----	----	----	----	"	"	4274
"	"	----	----	----	----	----	----	4 00	"	no	"	----	----	----	----	"	"	4275
s-mo.	"	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	4276
wk.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4277
s-mo.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	----	----	4278
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	no	no	4279
wk.	no	----	----	----	----	----	----	----	----	----	"	----	----	----	----	----	----	4280
s-mo.	yes	no	----	200	6	yes	yes	----	----	----	"	----	----	----	----	no	yes	4281
wk.	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	yes	"	4282
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	no	no	4283
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4284
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4285
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	yes	yes	4286
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4287
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	----	4288
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	no	4289
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	----	----	4290
s-mo.	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	yes	no	4291
wk.	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	yes	4292
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4293
s-mo.	yes	no	----	500	7	yes	yes	----	"	"	"	----	----	----	----	"	----	4294
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	yes	4295
wk.	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4296
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4297
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4298
s-mo.	no	----	----	----	----	----	----	6 00	----	yes	"	----	----	----	----	"	"	4299
"	"	----	----	----	----	----	----	6 00	no	no	"	----	----	----	----	"	"	4300

Book No. 87. **Table No. 1.—CONTINUED.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
4301	Lansing	22	Am.	----	m	2	1	Yardman	day	10	no	$1 00	50	Lack of work	$263	none
4302	"	26	Eng.	----	"	2	--	"	"	10	"	1 00	none	----------	313	$25
4303	"	43	Am.	----	"	2	3	"	"	10	"	1 50	52	Lack of work	391	none
4304	"	40	"	----	"	2	1	"	"	10	"	1 12	6	Pleasure	344	"
4305	"	23	"	----	s	--	--	"	"	10	"	1 00	12	Lack of work	301	100
4306	"	40	Ger.	9	m	3	3	"	"	10	"	1 25	6	Sickness	384	none
4307	"	39	"	9	"	2	2	"	"	10	"	1 25	6	"	384	"
4308	"	28	Irish	----	"	2	1	"	"	10	----	1 00	none	----------	313	"
4309	"	38	"	----	s	--	--	"	"	10	no	1 00	78	Pleasure	235	"
4310	"	36	Am.	----	m	2	4	"	"	10	"	1 00	none	----------	313	"
4311	"	32	Ger.	3	"	3	4	"	pc.	10	"	1 00	78	Lack of work	235	"
4312	"	36	"	6	"	2	6	"	"	10	"	1 00	78	" "	235	"
4313	Charlotte	32	Am.	----	"	2	1	"	wk.	10	"	85	90	" "	189	"
4314	"	28	"	----	"	2	1	"	---	10	"	52	200	" "	56	"
4315	"	36	"	----	s	--	--	"	day	10	yes	83	100	" "	177	"
4316	"	36	"	----	m	2	3	"	"	10	"	83	90	" "	185	"
4317	Ionia	56	"	----	"	4	--	"	"	10	no	90	68	Sickness	220	"
4318	"	53	Eng.	12	"	3	--	"	"	10	"	1 04	6	"	319	"
4319	Coldwater	42	Am.	----	"	2	6	"	"	10	yes	1 00	60	Lack of work	253	"
4320	Kalamazoo	19	"	----	s	--	--	Laborer	"	10	----	1 25	100	" "	266	"
4321	"	35	Ger.	15	m	2	2	"	"	10	----	1 30	100	" "	277	"
4322	"	36	Am.	----	"	2	--	"	"	10	----	1 35	96	" "	301	"
4323	"	21	"	----	s	--	--	"	"	10	----	1 10	90	" "	245	"
4324	"	23	"	----	"		--	"	"	10	----	1 25	100	" "	266	"
4325	"	19	"	----	"	--	--	"	"	10	----	1 00	90	" "	223	"
4326	"	23	"	----	m	2	1	"	"	10	---	1 50	30	" "	425	100
4327	"	22	Hol.	15	s	--	--	"	"	10	----	1 25	90	" "	278	100
4328	"	24	Am.	----	"	--	--	"	"	10	----	1 25	60	" "	316	none
4329	"	30	Ger.	----	m	2	1	"	"	10	----	1 30	30	" "	368	100
4330	"	35	Hol.	21	"	2	1	"	"	----	----	1 50	90	" "	335	none
4331	"	24	Ger.	15	s	--	--	"	"	10	----	1 25	90	" "	278	"
4332	"	40	Am.	----	m	2	2	"	pc.	10	----	2 00	100	" "	426	"
4333	"	18	"	----	s	--	--	"	day	10	----	1 00	90	" "	223	"
4334	"	21	"	----	"	--	--	"	pc.	10	----	1 25	30	" "	354	"
4335	"	17	"	----	"	--	--	"	day	10	----	75	30	" "	212	"
4336	"	19	"	----	"	--	--	"	"	10	----	1 00	60	" "	253	"
4337	"	21	Hol.	15	"	--	--	"	"	10	----	1 25	60	" "	316	"
4338	"	40	Ger.	16	m	2	2	"	"	10	----	1 75	90	" "	390	10
4339	"	21	Am.	----	s	--	--	"	"	10	----	1 50	60	" "	380	none
4340	"	22	Hol.	15	"	--	--	"	"	10	----	1 25	35	" "	348	"
4341	"	30	Am.	----	m	2	2	"	"	10	----	1 60	30	" "	453	125
4342	"	25	Hol.	18	s	--	--	"	"	----	----	1 60	60	" "	405	none
4343	"	25	"	8	m	2	--	"	"	10	----	1 50	30	" "	425	100
4344	"	21	Am.	----	s	--	--	"	"	10	----	1 50	60	" "	380	none
4345	"	18	Hol.	10	"	--	--	"	"	10	----	80	30	" "	226	"
4346	"	18	Am.	----	"	--	--	"	"	10	----	80	100	" "	170	"
4347	"	19	"	----	"	--	--	"	"	10	----	1 00	none	----------	313	25
4348	"	21	"	----	"	--	--	"	"	10	----	1 25	30	Lack of work	354	none
4349	"	35	"	----	m	2	1	"	"	10	----	1 25	60	" "	316	"
4350	"	28	"	----	s	--	--	"	"	10	no	1 10	150	" "	179	"

employés of manufacturers of vehicles.

How often are wages paid?	Do you own you home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	no							$5 00	yes	no	None					yes	yes	4301
"	yes	no					yes		"		"					"	"	4302
"	no							4 00	no	no	"					"	"	4303
"	"							7 00	"	"	"					"	"	4304
"											"					"	"	4305
"	yes	yes					yes		yes	no	"					"	"	4306
"	no							4 00	no	"	"					"	"	4307
"	"							5 00	yes	"	"					"	"	4308
"									no	"	Day Laborer's U.	yes	no	no	yes	"	"	4309
"	no								"	"	None					"	"	4310
"	"							5 00	"	"	"					no	no	4311
"	"							4 00	"	"	"					yes	yes	4312
"	"							4 00	"	"	"					"	"	4313
"	"							3 00	"	"	"					"	"	4314
"									yes	yes	"					"	"	4315
"	no							5 00	no	no	"					"	"	4316
s-mo.	"							8 00	yes	"	"					"	"	4317
"	yes	yes					yes		"	"	"					no	no	4318
wk.	no							5 00	no	"	"					yes	yes	4319
"											"					"	no	4320
"	no							7 00			Wheelm'k's Union					yes	yes	4321
"	"							6 00			" "					"	"	4322
"											None					"	"	4323
"											Wheelm'k's Union					"	"	4324
"											" "					"	"	4325
"	yes	yes					yes				" "					"	"	4326
"									yes		" "					no	no	4327
"									"		" "					yes	yes	4328
"	yes	yes					yes		"		" "					no	no	4329
"	"	"					"		no		" "					"	"	4330
"									yes		" "					"	"	4331
"	yes	yes					yes				" "					yes	yes	4332
"											None					"	"	4333
"											"					"	"	4334
"											"					"	"	4335
"											"					"	"	4336
"											"					"	"	4337
"	no								yes		Wheelm'k's Union					no	no	4338
"											" "					yes	yes	4339
"											" "					no	no	4340
"	yes	yes					yes				None					yes	yes	4341
"											Wheelm'k's Union					"	"	4342
"	no							7 50			None					no	no	4343
"											Wheelm'k's Union					yes	yes	4344
"											None					no	no	4345
"											"					yes	yes	4346
"											"					"	"	4347
"									yes		"					"	"	4348
"	no							7 00			"					"	"	4349
s-mo.	"							6 00			"					"	"	4350

Book No. 88. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
4351	Kalamazoo.	32	Am.	....	s	.	..	Laborer	day	10	...	$1 25	150	Lack of work	$204	none
4352	"	30	Irish	25	"	..	.	"	"	10	no	1 00	150	" "	163	"
4353	"	29	Hol.	23	m	2	4	"	"	10	"	1 25	30	" "	354	$25
4354	"	31	"	5	s	..	..	"	"	10	"	1 25	60	" "	316	none
4355	"	26	Am.	....	"	.	..	"	"	10	"	1 40	30	" "	396	50
4356	"	28	"	....	"	..	..	"	"	10	"	1 40	60	" "	356	none
4357	"	20	"	...	"	..	..	"	"	10	"	1 25	90	" "	279	"
4358	"	19	Hol.	11	"	..	..	"	"	10	...	1 25	45	" "	335	50
4359	"	23	Am.	....	"	..	.	"	"	10	...	1 25	40	" "	341	none
4360	"	20	"	....	"	..	..	"	"	10	...	1 25	40	" "	341	"
4361	"	22	"	...	"	..	..	"	"	10	no	1 00	100	" "	213	"
4362	"	30	"	....	"	..	..	"	"	10	"	1 25	90	" "	279	"
4363	"	38	"	...	"	..	..	"	"	10	"	1 25	200	" "	141	"
4364	"	45	"	...	m	2	4	"	"	10	"	1 50	200	" "	170	"
4365	"	30	"	...	s	..	..	"	"	10	"	1 25	90	" "	278	5
4366	"	25	"	...	"	.	..	"	"	10	....	1 25	30	" "	354	none
4367	"	26	"	...	m	2	..	"	"	10	...	1 25	45	" "	336	"
4368	"	20	"	....	s	..	..	"	pc.	10	no	1 25	60	" "	316	"
4369	"	18	Hol.	10	"	..	..	"	day	10	"	1 00	150	" "	163	"
4370	"	18	Am.	....	"	..	..	"	"	10	"	1 00	none	....	313	"
4371	"	58	Ger.	15	m	2	1	"	"	10	...	1 15	"	....	360	"
4372	"	50	"	..	"	2	2	"	"	10	....	1 25	30	Lack of work	354	"
4373	"	22	"	16	s	..	..	"	"	10	....	1 25	30	" "	354	"
4374	"	55	Ital.	40	m	2	4	"	"	10	...	1 35	30	" "	382	"
4375	"	25	Am.	....	s	..	..	"	"	10	no	1 25	30	" "	354	"
4376	"	18	"	....	"	..	..	"	"	10	"	1 25	45	" "	335	"
4377	"	21	Hol.	...	"	.	..	"	"	10	"	1 35	40	" "	365	"
4378	"	21	Am.	...	"	..	.	"	"	10	"	1 25	35	" "	348	"
4379	"	22	"	...	"	..	..	"	"	10	"	1 40	30	" "	396	10
4380	"	24	"	...	"	.	..	"	"	10	"	1 40	30	" "	396	none
4381	"	60	Ger.	10	m	2	6	"	"	10	....	1 25	10	" "	379	"
4382	"	19	Hol.	10	s	..	..	"	"	10	...	1 00	60	" "	253	"
4383	"	35	Ger.	10	m	2	1	"	"	10	....	1 25	30	" "	353	"
4384	"	17	Am.	....	s	..	..	"	"	10	....	90	30	" "	255	"
4385	"	19	"	...	"	..	..	"	"	10	no	1 00	none	....	313	75
4386	"	21	Hol.	10	"	..	..	"	"	10	....	1 15	30	Lack of work	325	none
4387	"	55	Am.	....	m	2	7	"	"	10	....	1 10	30	" "	311	"
4388	"	50	Hol.	21	"	2	3	"	"	10	...	1 10	60	" "	278	"
4389	"	19	"	18	s		.	"	"	10	....	90	30	" "	255	"
4390	"	35	Irish	20	m	2	1	"	"	10	...	1 25	50	" "	328	"
4391	"	50	"	40	"	2	2	"	"	10	....	1 10	30	" "	311	"
4392	"	21	Am.	...	s	..	.	"	"	10	...	1 00	60	" "	253	"
4393	"	18	Hol.	6	"	..	..	"	"	10	no	90	60	" "	228	"
4394	"	17	"	...	"	..		"	"	10	...	75	30	" "	212	"
4395	"	17	"	....	"	..	..	"	"	10	no	75	60	" "	190	"
4396	"	30	Am.	....	m	2	2	"	"	10	....	1 25	30	" "	354	"
4397	"	20	"	...	s	..	..	"	"	10	....	1 00	50	" "	263	"
4398	"	21	Hol.	...	"	..	..	"	"	10	...	1 25	30	" "	354	"
4399	"	22	Am.	...	"	..	..	"	"	10	....	1 25	60	" "	316	"
4400	"	17	Hol.	16	"	..	.	"	"	10	....	85	30	" "	241	"

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
-mo.									yes		None					yes	yes	4351
wk.									no		"					"	"	4352
mo.	yes	yes					yes		yes		"					"	"	4353
"									"		"					"	"	4354
"											"					"	"	4355
"									no		"					"	"	4356
"											"					"	"	4357
"									yes		"					no	no	4358
"											"					yes	yes	4359
"											"					no	no	4360
wk.											"					yes	"	4361
"											"					"	yes	4362
"											"					"	no	4363
"	no										Knights of Labor	no	no	no	yes	"	yes	4364
"									no	no	None					"	"	4365
mo.									yes		"					"	"	4366
"	yes	yes					yes				"					"	"	4367
wk.											"					"	"	4368
"											"					no	no	4369
"											"					"	"	4370
"	yes	yes					yes		yes		Wheelm'k's Union					"	"	4371
"	no							$6 50			" "					"	"	4372
"											" "					yes	yes	4373
"	yes	yes					yes				" "					no	no	4374
"											" "					yes	yes	4375
"									yes		None					"	"	4376
"									"		Wheelm'k's Union	no	yes	no		"	"	4377
"											" "	"	"	"		"	"	4378
"											" "	"	"	"		"	"	4379
"									yes		" "	"	"	"		"	"	4380
"	no							6 50			None					no	no	4381
"											Wheelm'k's Union					yes	"	4382
"	yes	yes					no		yes		None					no	"	4383
"											"					yes	yes	4384
"											Wheelm'k's Union					"	"	4385
"											None					"	"	4386
"	yes	no	cont.	$200	6	yes	yes		yes		"					"	"	4387
"	"	yes					"				"					"	"	4388
"											"					"	"	4389
"	yes	no	cont.	250	6	yes	yes		no		Wheelm'k's Union					"	"	4390
"	"	yes					"				None					"	"	4391
"											"					"	"	4392
"											"					"	"	4393
"											"					no	no	4394
"											"					yes	yes	4395
"	yes	yes					no		yes		Wheelm'k's Union					"	"	4396
"											None					"	"	4397
"											Wheelm'k's Union					"	no	4398
"											" "					"	yes	4399
"											None					no	no	4400

Book No. 89.

Table No. 1.—Continued.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
4401	Kalamazoo.	18	Hol.	10	s	--	--	Laborer....	day	10	----	$1 00	35	Lack of work	$278	none
4402	"	20	"	15	"	--	--	" ----	"	10	----	1 00	30	" "	283	"
4403	"	16	"	12	"	--	--	" ----	"	10	----	75	30	" "	212	"
4404	"	30	"	----	m	2	2	" ----	"	10	no	1 25	40	" "	341	$50
4405	"	21	Am.	----	s	--	--	" ----	"	10	----	1 25	30	" "	354	none
4406	"	25	"	----	"	--	--	" ----	"	10	----	1 25	40	" "	341	"
4407	"	19	Hol.	15	"	--	--	" ----	"	10	no	1 25	30	" "	354	"
4408	"	16	Am.	----	"	--	--	" ----	"	10	"	1 00	none	--------------	313	75
4409	"	35	Irish	----	m	2	2	" ----	"	10	----	1 75	60	Lack of work	316	none
4410	"	35	Am.	----	"	2	2	" ----	"	10	----	1 50	30	" "	425	50
4411	"	18	"	----	s	--	--	" ----	"	10	----	1 00	60	" "	253	none
4412	"	45	"	----	m	2	1	" ----	"	10	----	1 00	120	" "	193	"
4413	"	25	"	----	s	--	--	" ----	"	10	----	1 25	150	" "	204	"
4414	"	20	Irish	18	"	--	--	" ----	"	10	----	1 00	55	" "	258	20
4415	"	22	Hol.	15	"	--	--	" ----	"	10	----	1 25	100	" "	266	15
4416	"	25	Am.	----	"	--	--	" ----	"	10	no	1 50	none	--------------	460	50
4417	"	19	"	----	"	--	--	" ----	"	10	"	1 25	200	Lack of work	140	none
4418	"	35	"	----	m	--	--	" ----	"	10	"	1 75	40	" "	478	75
4419	"	36	"	----	s	--	--	" ----	"	10	"	1 25	45	" "	335	15
4420	"	19	"	----	"	--	--	" ----	"	10	"	1 50	none	--------------	470	95
4421	"	24	"	----	"	--	--	" ----	"	10	"	1 25	30	Lack of work	354	none
4422	"	45	"	----	m	2	1	" ----	"	10	"	1 25	10	" "	379	"
4423	"	21	"	----	s	--	--	" ----	"	10	"	1 25	30	" "	354	"
4424	"	40	Ger.	19	m	2	2	" ----	"	10	"	1 25	35	" "	348	"
4425	"	26	Am.	----	s	--	--	" ----	----	10	"	1 00	90	" "	223	"
4426	"	30	Hol.	----	m	2	2	" ----	day	10	"	1 50	none	--------------	470	50
4427	"	25	"	----	s	--	--	" ----	"	10	"	1 25	"	--------------	391	5
4428	"	16	"	----	"	--	--	" ----	"	10	"	50	"	--------------	157	none
4429	"	35	Am.	----	m	2	2	" ----	"	10	"	1 40	"	--------------	438	------
4430	"	21	"	----	s	--	--	" ----	"	10	----	1 10	60	Lack of work	278	none
4431	Flint	42	Can.	35	m	2	1	" ----	"	10	yes	1 00	104	" "	209	"
4432	Kalamazoo.	21	Hol.	15	s	--	--	" ----	"	10	----	1 25	30	" "	353	50
4433	"	21	Am.	----	"	--	--	" ----	"	10	----	1 10	30	" "	311	none
4434	"	18	Ger.	10	"	--	--	" ----	"	10	----	90	60	" "	228	"
4435	"	25	Am.	----	m	2	1	" ----	"	10	----	1 25	30	" "	354	25
4436	"	20	Hol.	15	s	--	--	" ----	"	10	no	1 00	65	" "	248	none
4437	"	24	Am.	----	"	--	--	" ----	"	10	"	1 25	30	" "	354	"
4438	"	29	Hol.	20	"	--	--	" ----	"	10	"	1 25	60	" "	316	"
4439	"	27	Am.	----	"	--	--	" ----	"	10	"	1 15	60	" "	316	"
4440	"	30	"	----	"	--	--	" ----	"	10	"	1 25	40	" "	341	"
4441	"	22	Hol.	15	"	--	--	" ----	"	10	"	1 00	60	" "	253	"
4442	"	52	Am.	----	m	2	--	" ----	"	10	"	1 25	60	" "	316	"
4443	"	19	"	----	s	--	--	" ----	"	10	"	1 00	90	" "	228	"
4444	Jackson....	38	Ger.	2	m	2	2	" ----	"	10	yes	1 25	15	" "	373	"
4445	" ----	44	Irish	40	"	2	2	" ----	"	10	no	1 00	none	--------------	313	"
4446	" ----	37	Am.	----	"	2	3	" ----	"	10	"	1 25	15	Lack of work	373	"
4447	" ----	29	Ger.	3	"	2	1	" ----	"	10	"	1 25	30	Sickness	354	50
4448	" ----	26	Am.	----	"	2	--	" ----	"	10	"	1 25	30	" -----	354	none
4449	" ----	29	Ger.	15	"	2	--	" ----	"	10	"	1 00	none	--------------	313	"
4450	" ----	33	Scot.	----	"	2	--	" ----	"	10	"	1 50	6	Sickness	461	25

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.											None					yes	yes	4401
"											Wheelm'k's Union					no	no	4402
"											None					"	"	4403
mo.	yes	yes					yes		yes		"					"	"	4404
"											"					yes	yes	4405
"											"					"	"	4406
"											"					"	"	4407
"											"					"	"	4408
"	no							$7 00			"					"	"	4409
wk.	yes	yes					yes				Wheelm'k's Union					"	"	4410
"											None					"	"	4411
"	no							6 00			"					"	"	4412
"											C. & W. M. U.				yes	"	"	4413
"											None					"	"	4414
"									yes		"					no	no	4415
"									"		"					yes	"	4416
"											"					"	"	4417
"	no							7 00	yes		C. & W. M. U.				yes	"	yes	4418
"											None					"	"	4419
"											"					"	"	4420
"											"					"	"	4421
"	yes	no		$100	6	yes	yes				"					"	"	4422
"											"					"	"	4423
"	yes	yes					yes		yes		"					no	no	4424
s-mo.									"		"					yes	yes	4425
"	no							6 00	"		"					"	no	4426
"									"		"					"	yes	4427
"											"					no	no	4428
"	no							7 00			"					yes	yes	4429
wk.											"					"	"	4430
"	no								yes	yes	"					"	"	4431
"									"		Wheelm'k's Union					no	no	4432
"											None					yes	yes	4433
"											"					"	"	4434
"	yes	yes					yes		yes		Wheelm'k's Union					"	"	4435
"											None					"	"	4436
"											"					"	"	4437
"											"					no	no	4438
"									yes		"					yes	yes	4439
"											"					"	"	4440
"									yes		"					no	no	4441
"	yes	yes					yes				"					yes	yes	4442
"											"					"	"	4443
s-mo.	no							5 00			"					no	no	4444
wk.	yes	no					yes				"					yes	yes	4445
"	"	"	mort.	700	7	yes	"		no	no	"					"	"	4446
"	"	"	cont.	300	7	"	"		yes	"	"					no	no	4447
"	no							7 00	no	"	"					yes	yes	4448
"	"							7 00	"	"	"					"	"	4449
"	"							9 00	"	"	"					"	"	4450

Book No. 90. **Table No. 1.—CONTINUED.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
4451	Jackson	29	Am.	----	s	--	--	Laborer	day	10	no	$1 75	12	Sickness	$527	none
4452	"	27	"	----	"	--	--	"	"	10	"	1 25	none		391	$100
4453	"	32	"	----	m	2	1	"	"	10	"	1 25	20	Lack of work	366	none
4454	"	29	"	----	s	--	--	"	"	10	"	1 35	10	" "	409	50
4455	"	45	Ger.	30	m	2	2	"	"	10	"	1 50	15	" "	447	75
4456	"	27	"	----	"	2	1	"	"	10	"	1 50	30	" "	425	75
4457	"	38	Am.	----	"	2	--	"	pc.	10	"	1 50	60	" "	380	none
4458	"	27	"	----	"	2	1	"	day	10	"	1 50	none		470	"
4459	"	49	"	----	"	2	1	"	"	10	"	1 25	10		380	"
4460	"	42	"	----	"	2	2	"	"	10	"	1 25	none		391	"
4461	"	25	Irish	----	s	--	--	"	pc.	10	"	1 50	"		470	50
4462	"	23	"	----	m	2	1	"	day	10	"	1 25	"		391	50
4463	"	21	Am.	----	s	--	--	"	"	10	"	1 25	"		391	none
4464	"	28	"	----	m	2	--	"	"	10	"	1 25	60	Sickness *	316	"
4465	"	30	"	----	"	2	--	"	"	10	"	1 25	15	Lack of work	373	"
4466	"	36	"	----	"	2	2	"	"	10	"	1 25	30	Sickness	354	"
4467	"	19	"	----	s	--	--	"	"	10	"	1 00	none		313	20
4468	"	31	"	----	m	2	--	"	"	10	"	1 25	30	Sickness	354	none
4469	"	25	"	----	s	--	--	"	"	10	"	1 25	30		354	"
4470	"	32	Ger.	2	m	2	2	"	"	10	"	1 25	10		379	"
4471	"	53	Am.	----	"	4	--	"	"	10	"	1 25	3		388	"
4472	"	26	Irish	----	"	2	1	"	"	10	"	1 25	30	Lack of work	354	25
4473	"	24	Am.	----	s	--	--	"	"	10	"	1 25	60	" "	316	none
4474	"	21	"	----	"	--	--	"	"	10	yes	1 25	26	" "	359	"
4475	"	19	"	----	"	--	--	"	"	10	"	1 00	175	Sickness	138	"
4476	"	21	"	----	"	--	--	"	"	10	"	1 25	30	Lack of work	354	"
4477	"	38	Pol.	----	m	2	4	"	"	10	"	1 25	10	Pleasure	379	"
4478	"	16	Ger.	6	s	--	--	"	"	10	no	75	30	Lack of work	212	20
4479	"	25	Am.	----	m	2	--	"	"	10	"	1 25	15	" "	373	none
4480	"	25	"	----	"	2	--	"	"	10	"	1 25	6	" "	384	75
4481	"	43	"	----	"	2	1	"	"	10	"	1 50	10	" "	455	75
4482	"	20	Scot.	----	"	--	--	"	"	10	"	1 00	none		313	none
4483	"	23	Am.	----	s	--	--	"	pc.	10	"	1 25	"		391	"
4484	"	25	"	----	m	2	2	"	day	10	"	1 25	12		376	25
4485	"	36	Eng.	5	s	--	--	"	"	10	"	1 00	201	Pleasure *	112	none
4486	"	37	Ger.	5	m	2	4	"	"	10	yes	1 00	100	Sickness	213	"
4487	"	55	"	24	"	3	--	"	"	10	"	1 00	60	Lack of work	253	"
4488	"	46	Am.	----	"	2	3	"	"	10	no	1 20	30	" "	339	"
4489	"	43	Ger.	41	"	2	2	"	"	10	yes	1 20	20	Pleasure*	352	50
4490	"	23	Am.	----	s	--	--	"	pc.	10	"	1 35	7		413	none
4491	"	64	"	---	m	4	--	"	"	10	"	1 50	10	Pleasure	455	"
4492	"	18	Can.	8	s	--	--	"	day	10	"	75	102		158	"
4493	"	26	Irish	7	"	--	--	"	"	10	"	1 15	50	Pleasure*	417	"
4494	"	22	Eng.	----	m	2	--	"	"	10	"	1 25	100	Sickness	266	"
4495	"	34	Am.	----	"	2	2	"	"	10	"	1 25	none		391	"
4496	Detroit	44	Pol.	16	"	2	2	"	"	10	no	1 10	60	Lack of work	278	......
4497	"	23	Am.	----	s	--	--	"	"	10	"	1 25	30	" "	354	none
4498	"	21	"	----	"	--	--	"	"	10	"	1 00	90	" "	223	"
4499	"	48	"	----	"	--	--	"	"	10	"	1 00	156	" "	157	"
4500	"	21	"	----	"	--	--	"	"	10	"	1 00	none		313	"

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* And lack of work.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	----	----	----	----	----	----	----	----	yes	no	None	----	----	----	----	yes	yes	4451
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	4452
"	no	----	----	----	----	----	----	$7 00	"	"	"	----	----	----	----	"	"	4453
"	"	----	----	----	----	----	----	8 00	"	"	"	----	----	----	----	"	"	4454
"	yes	no	mort.	$300	6	yes	yes	----	"	"	"	----	----	----	----	no	no	4455
"	"	"	"	500	7	"	"	----	"	"	"	----	----	----	----	yes	yes	4456
"	"	yes	----	----	----	----	"	----	"	"	"	----	----	----	----	"	"	4457
"	no	----	----	----	----	----	----	4 00	"	"	"	----	----	----	----	"	"	4458
"	"	----	----	----	----	----	----	6 00	"	"	"	----	----	----	----	"	"	4459
"	"	----	----	----	----	----	----	6 00	yes	"	"	----	----	----	----	"	"	4460
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	4461
"	yes	no	mort.	250	7	yes	yes	----	"	"	"	----	----	----	----	"	"	4462
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4463
"	no	----	----	----	----	----	----	6 00	"	"	"	----	----	----	----	"	"	4464
"	yes	no	cont.	400	7	yes	ye	----	"	"	"	----	----	----	----	"	"	4465
"	no	----	----	----	----	----	----	7 50	"	"	"	----	----	----	----	"	"	4466
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4467
"	yes	no	mort.	500	7	yes	yes	----	yes	"	"	----	----	----	----	"	"	4468
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	"	4469
"	yes	no	mort.	60	6	yes	yes	----	"	"	"	----	----	----	----	"	"	4470
"	"	"	"	850	7	"	"	----	yes	"	"	----	----	----	----	"	"	4471
"	no	----	----	----	----	----	----	7 00	"	"	"	----	----	----	----	"	"	4472
"	"	----	----	----	----	----	----	6 00	no	"	"	----	----	----	----	"	"	4473
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4474
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4475
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4476
"	no	----	----	----	----	----	----	5 00	----	----	"	----	----	----	----	"	"	4477
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	no	no	4478
"	no	----	----	----	----	----	----	8 00	"	"	"	----	----	----	----	yes	yes	4479
"	"	----	----	----	----	----	----	6 00	"	"	"	----	----	----	----	"	"	4480
"	yes	no	cont.	50	7	yes	yes	----	"	"	"	----	----	----	----	"	"	4481
"	no	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4482
"	"	----	----	----	----	----	----	7 00	"	"	"	----	----	----	----	"	"	4483
"	"	----	----	----	----	----	----	6 00	"	"	"	----	----	----	----	"	"	4484
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4485
"	yes	no	mort	250	7	yes	yes	----	yes	"	"	----	----	----	----	"	"	4486
"	"	yes	----	----	----	----	"	----	"	"	"	----	----	----	----	"	"	4487
"	"	no	mort	1,200	7	yes	no	----	no	"	"	----	----	----	----	"	no	4488
"	"	"	"	300	7	"	yes	----	yes	"	"	----	----	----	----	"	yes	4489
"	----	----	----	----	----	----	----	----	----	----	"	----	----	----	----	"	"	4490
"	no	----	----	----	----	----	----	10 00	yes	no	"	----	----	----	----	"	"	4491
"	----	----	----	----	----	----	----	----	no	"	"	----	----	----	----	"	no	4492
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4493
s-mo.	no	----	----	----	----	----	----	3 00	"	"	"	----	----	----	----	no	yes	4494
wk.	"	----	----	----	----	----	----	4 00	----	----	"	----	----	----	----	yes	"	4495
s-mo.	yes	no	cont.	200	7	yes	yes	----	----	----	"	----	----	----	----	"	"	4496
"	----	----	----	----	----	----	----	----	no	no	"	----	----	----	----	"	"	4497
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4498
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4499
"	----	----	----	----	----	----	----	----	"	"	"	----	----	----	----	"	"	4500

Book No. 91. **Table No. 1.—CONTINUED.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
4501	Detroit -----	37	Am.	----	m	2	2	Laborer ----	day	10	no	$1 25	90	Lack of work	$279	none
4502	" -----	25	"	----	s	--	--	" ----	"	10	"	1 25	156	" "	196	"
4503	" -----	29	"	----	"	--	--	" ----	"	10	"	1 25	60	" "	316	"
4504	" -----	40	Ger.	15	m	2	4	" ----	"	10	"	1 50	60	" "	380	"
4505	" -----	21	Am.	----	s	--	--	" ----	"	10	"	1 00	90	" "	223	"
4506	" -----	23	"	----	"	--	--	" ----	"	10	"	1 25	30	" "	354	$50
4507	" -----	21	"	----	"	--	--	" ----	"	10	"	1 00	60	" "	253	none
4508	" -----	35	Ger.	13	m	2	3	" ----	"	10	"	1 50	60	" "	380	50
4509	Three Rivers	24	"	----	s	--	--	" ----	"	10	"	1 00	10	----------------	303	------
4510	" "	34	Can.	33	m	2	--	" ----	"	10	"	1 00	30	Lack of work	253	------
4511	" "	28	Am.	----	"	2	2	" ----	"	10	"	1 10	7	Sickness -----	337	none
4512	" "	54	"	----	"	3	--	" ----	"	10	"	1 12	15	" *----	334	"
4513	" "	31	"	----	"	2	2	" ----	"	10	yes	1 35	18	" -----	399	"
4514	" "	27	"	----	"	2	--	" ----	"	10	no	95	50	Lack of work	250	25
4515	" "	45	Ger.	27	"	2	4	" ----	"	10	yes	1 00	5	" "	308	none
4516	" "	18	Am.	----	s	--	--	" ----	"	10	no	94	100	" "	200	"
4517	" "	37	"	----	m	2	--	" ----	"	10	"	1 25	50	" "	329	"
4518	" "	40	"	----	"	2	2	" ----	"	10	"	1 44	50	" "	379	104
4519	Flint -------	59	"	----	"	5	-	" ----	pc.	10	"	75	30	" "	212	none
4520	" -------	24	"	----	"	2	--	" ----	day	10	"	1 00	75	" "	238	"
4521	" -------	27	"	----	"	2	--	" ----	"	10	yes	1 25	60	" "	216	50
4522	" -------	29	"	----	"	2	--	" ----	"	10	"	1 25	130	" "	229	none
4523	" -------	28	"	----	"	2	--	" ----	"	10	"	1 00	7	Vacation ----	306	100
4524	" -------	27	"	----	"	2	--	" ----	"	10	no	1 25	12	Lack of work	376	100
4525	" -------	17	"	----	s	--	--	" ----	"	10	"	70	52	" "	183	none
4526	" -------	32	"	----	w	1	1	" ----	"	10	"	1 50	52	" "	392	"
4527	" -------	55	"	----	m	2	2	" ----	"	10	"	1 25	78	" "	294	"
4528	" -------	28	"	----	"	2	1	" ----	"	10	"	1 25	12	" "	376	170
4529	" -------	34	"	----	s	--	--	" ----	"	10	"	1 25	10	" "	378	80
4530	" -------	27	Ger.	24	"	--	--	" ----	"	10	"	1 25	78	" "	273	none
4531	" -------	35	Am.	----	m	2	--	" ----	"	10	"	1 25	30	" "	354	50
4532	" -------	25	"	----	s	--	--	" ----	"	10	"	1 75	40	" "	478	25
4533	" -------	35	Ital.	12	w	1	6	" ----	"	10	yes	1 25	58	" "	319	50
4534	Bay City ----	15	Ger.	11	s	--	--	" ----	"	10	----	70	30	" "	198	none
4535	" ----	42	Am.	----	m	2	--	" ----	"	10	yes	1 40	10	Vacation ----	424	"
4536	" ----	18	Ger.	13	s	--	--	" ----	"	10	no	1 00	24	Sickness -----	289	"
4537	" ----	20	Am.	----	"	--	--	" ----	"	10	"	75	52	Laid off -----	196	"
4538	" ----	26	Can.	20	"	--	--	" ----	"	10	"	1 25	40	Lack of work	341	"
4539	" ----	19	Am.	----	"	--	--	" ----	"	10	"	1 75	6	Sickness -----	537	"
4540	" ----	18	Pol.	12	"	--	--	" ----	"	10	"	75	6	Vacation ----	230	"
4541	" ----	21	Can.	16	"	--	--	" ----	"	10	"	1 00	12	Lack of work	301	"
4542	" ----	19	Am.	----	"	--	--	" ----	"	10	yes	1 12	10	Other business.	340	50
4543	" ----	18	"	----	"	--	--	" ----	"	10	"	75	52	Lack of work	196	none
4544	" ----	16	"	----	"	--	--	" ----	"	10	no	1 00	12	Sickness -----	301	"
4545	" ----	19	Can.	18	"	--	--	" ----	"	10	"	1 25	90	Lack of work	279	"
4546	" ----	19	"	8	"	--	--	" ----	"	10	"	1 00	5	Holidays -----	308	"
4547	" ----	18	Am.	----	"	--	--	" ----	"	10	yes	75	10	Sickness -----	227	175
4548	W. Bay City	20	Can.	16	"	--	--	" ----	"	10	"	1 00	13	Vacation ----	300	25
4549	" "	20	Am.	----	"	--	--	" ----	"	10	no	1 00	104	Lack of work	209	none
4550	Lansing ----	17	"	----	"	--	--	" ----	"	10	"	75	8	" "	229	"

* And lack of work.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance.	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
s-mo.	no							$6 00	no	no	None					yes	yes	4501
"											"					"	"	4502
"									no	no	"					"	"	4503
"	yes	yes							yes	"	"					"	"	4504
"									no	"	"					"	"	4505
"									"	"	"					"	"	4506
"									"	"	"					"	"	4507
"	yes	yes							"	"	"					"	"	4508
wk.									yes	"	"					no	"	4509
"	no							5 00	"	"	"					yes	"	4510
"	"							5 00	"	"	"					"	"	4511
"	yes	no	mort.	$350	7	yes	yes		"	"	"					"	"	4512
"	no							5 00	"	"	"					"	"	4513
"	yes	yes					yes		"	"	"					"	"	4514
"	no							3 00	no	"	"					"	"	4515
"											"					"	no	4516
"	yes	yes					yes		yes	no	"					"	yes	4517
"	"	no	mort.	400	6	yes	"		"	yes	"					"	"	4518
"	no							5 00	no	no	"					no	"	4519
"	"							5 00			"					yes	"	4520
"	"							5 00	yes	yes	"					"	"	4521
"	yes	yes					yes		"	"	"					"	"	4522
"	no							6 00	"	no	"					"	"	4523
"	"							5 00	no	yes	"					no	"	4524
"											"					yes	"	4525
"	no								no	no	"					no	no	4526
"	"							6 50	"	"	"					yes	"	4527
"	yes	no	cont.	390	6	yes	yes		"	yes	"					no	"	4528
"									"	no	"					"	"	4529
"									"	"	"					yes	yes	4530
"	yes	yes					yes				"					no	no	4531
"									yes	no	"					yes	"	4532
"	no							4 00	"	"	"					no	"	4533
"									no	"	"					"	"	4534
"	yes	no	cont.	84	5	no	yes		yes	"	"					ye	yes	4535
"									no		"					"	"	4536
"									"		"					"	"	4537
"									"		B. of B. M.				yes	"	"	4538
"	yes	yes					no				None					"	"	4539
"											"					"	"	4540
"									no	no	"					"	"	4541
"									"	"	B. of B. M.	no	no	no	yes	"	"	4542
"									"		"	"	"	"	"	"	"	4543
"									"	no	None					"	"	4544
"									"	"	B. of B. M.	no	no	no	yes	"	"	4545
"									"	"	"	"	"	"	"	"	"	4546
"									"	"	None					"	"	4547
"									"	"	"					"	"	4548
"									"	"	"					"	"	4549
"										yes	"					"	"	4550

Book No. 92.

Table No. 1.—Continued.—*Statistics of*

Number of schedule.	Residence.	Age.	Nationality.	If foreign born, how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
4551	Lansing ----	30	Am.	----	s	--	--	Laborer ----	day	10	yes	$1 00	13	Lack of work	$300	$50
4552	" ----	19	"	----	"	--	--	" ----	"	10	"	1 00	30	Pleasure* ----	283	5
4553	" ----	16	"	----	"			" ----	"	10	no	60	25	Lack of work	173	none
4554	" ----	27	"	----	m	2	1	" ----	"	10	----	1 00	40	" "	273	"
4555	" ----	21	"	----	s	--	--	" ----	"	10	----	1 00	50	" "	263	25
4556	" ----	52	Ger.	23	m	2	7	" ----	"	10	no	1 00	165	" "	148	none
4557	" ----	48	"	6	"	2	6	" ----	"	10	"	1 10	40	" "	300	"
4558	Traverse City	33	Can.	4	"	2	1	" ----	"	10	----	1 35	none	----------------	425	"
4559	" "	34	Boh.	8	"	2	1	" ----	"	10	no	1 25	"	----------------	391	"
4560	G'd Rapids.	36	Eng.	30	"	2	1	" ----	"	10	"	1 25	78	----------------	294	"
4561	"	18	Am.	----	s	--		" ----	"	10	"	1 00	90	Lack of work	223	"
4562	Pontiac ----	25	"	--	"		--	" ----	"	10	--	1 25	none	----------------	391	30
4563	" ----	53	Eng.	26	m	7	--	" ----	"	10	no	1 25	"	----------------	391	none
4564	" ----	19	Am.	----	s	--	--	" ----	"	10	"	1 00	14	Sickness ----	299	"
4565	" ----	26	"	----	m	2	1	" ----	"	10	"	1 50	none	----------------	470	"
4566	" ----	44	Can.	3	s		--	" ----	"	10	"	1 25	"	----------------	391	"
4567	" ----	31	Am.	----	m	3	1	" ----	"	10	"	1 25	9	Laid off ----	380	55
4568	" ----	25	Scot.	23	s	--	--	" ----	"	10	"	1 00	30	Lack of work	283	none
4569	" ----	34	Irish	31	m	2	3	" ----	wk.	10	"	1 16	10	Pleasure ----	352	"
4570	" ----	27	"	20	"	2	2	" ----	"	10	"	1 16	6	Sickness ----	356	"
4571	Ionia -------	37	Prus.	14	"	2	6	" ----	day	10	"	1 60	60	Lack of work	405	"
4572	" -------	28	Am.	----	"	2	--	" ----	"	10	"	1 00	90	" "	223	"
4573	" -------	41	Ger.	30	"	2	--	" ----	"	10	"	1 25	78	" " *	314	"
4574	Battle Creek	20	"	----	s	--	--	" ----	"	10	yes	94	10	Laid off ----	300	"
4575	" "	20	Am.	----	"	--	--	" ----	"	10	"	98	20	" ----	310	40
4576	" "	24	"	----	"	--	--	" ----	"	10	"	1 03	12	" ----	325	50
4577	Charlotte --	24	"	----	m	2	1	" ----	wk.	10	"	75	100	Lack of work*	160	none
4578	" --	29	"	----	"	2	2	" ----	day	10	no	1 00	60	" "	253	"
4579	Jonesville --	16	Ger.	----	s	--	--	" ----	"	10	"	58	261	At school ----	31	"
4580	" --	48	Fr.	37	m	2	--	" ----	"	10	"	1 00	6	Lack of work	307	"
4581	" -	24	Am.	----	"	2	1	" ----	"	10	"	1 10	30	" "	311	"
4582	Mt. Clemens	30	Ger.	14	"	2	2	" ----	"	10	"	1 25	18	" "	368	50
4583	"	40	"	----	"	2	5	" ----	"	10	"	1 37	18	" " *	404	none
4584	"	31	"	22	"	2	2	" ----	"	10	"	1 25	15	" " †	373	30
4585	Northville --	30	Am.	----	"	2	--	" ----	"	10	yes	1 15	18	" "	339	75
4586	Owosso -----	35	"	----	s		--	" ----	pc.	10	no	67	156	Sickness ---	105	none
4587	Flint -------	28	"	----	m	2	4	" ----	day	10	yes	1 25	90	Lack of work*	279	"
4588	G'd Rapids	19	Hol.	15	s			Teamster ---	wk	10	no	1 16	none	----------------	363	"
4589	"	71	Can	45	m	2	1	" ---	day	10	"	1 50	"	----------------	470	"
4590	"	18	Hol.	16	s		--	" ---	wk.	----	"	85	"	----------------	266	"
4591	"	59	Can.	44	m	2	--	" ---	day	10	"	1 50	"	----------------	470	100
4592	"	38	Am.	----	"	2	3	" ---	"	10	"	1 50	"	----------------	470	100
4593	"	28	"	----	"	2	--	" ---	wk	10	"	1 10	78	Lack of work	259	none
4594	Flint -------	41	"	----	"	2	4	" ---	day	10	yes	1 50	4	Vacation ----	464	"
4595	" -------	44	Can.	37	"	2	2	" ---	"	10	"	1 13	78	Laid off ----	266	"
4596	" -------	38	Am.	----	"	2	3	" ---	"	10	no	1 50	22	Sickness ----	437	"
4597	" -------	28	"	----	"	2	--	" ---	"	10	yes	1 25	6	" ----	381	"
4598	" -------	41	"	----	"	2	1	" ---	"	10	"	1 42	4	Vacation ----	439	"
4599	Kalamazoo	24	"	----	s		--	" ---	"	10	----	1 25	none	----------------	391	"
4600	"	32	"	----	m	2	1	" ---	"	10	----	1 25	"	----------------	391	"

* And sickness.
† And holidays.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	yes	no	mort.	$800	7	yes	yes		no	no	None					yes	yes	4551
"									"	"	"					"	"	4552
"									"	"	"					"	"	4553
	no							$6 00	"	"	"					"	"	4554
									"	"	"					"	"	4555
s-mo.	no							7 00	"	"	"					"	"	4556
"	"							5 00	"	"	"					no	no	4557
wk.	"										"					"	"	4558
"	"							5 00	no	no	"					"	"	4559
"	"							6 00	yes	"	"					yes	yes	4560
"									no	"	"					"	"	4561
"									"	"	"					"	"	4562
"	yes	yes					yes		yes	"	"					no	no	4563
"									no	"	"					yes	yes	4564
"	no							6 00			"					"	"	4565
"									no	no	"					"	"	4566
"	yes	no	mort.	495	7	yes	yes		yes	"	"					"	"	4567
"									no	"	"					"	"	4568
"	no							7 00	"	"	"					"	"	4569
"	"							5 00			"					"	"	4570
"	yes						yes		yes	no	"					"	"	4571
s-mo.	no							6 00	"		"					"	"	4572
"	yes	yes					yes		"	no	"					"	"	4573
wk.									no	"	"					no	no	4574
"									yes		"					yes	yes	4575
"									"	no	"					"	"	4576
"	no							4 00	"	"	"					"	"	4577
"	"							5 00	"	"	"					"	"	4578
"									"	"	"					"	"	4579
s-mo.	no							5 00	"	"	"					"	"	4580
"	yes	no	cont.	125	7	yes	yes		"	"	"					"	"	4581
wk.	"	yes					"		"	"	*	no	yes	no	no	"	"	4582
"	"	no	mort.	400	7	yes	"		"	"	*	"	"	"	"	"	"	4583
"	"	"	"	400	5	"	"				*	"	"	"	"	"	"	4584
"	no							5 00	yes	no	None					"	"	4585
"										yes	"					"	"	4586
"	yes	no	mort.	600	7	yes	yes		yes	"	"					"	"	4587
s-mo.									no	no	"					"	"	4588
wk.	yes	no	mort.	900	7	yes	yes		yes	"	"					"	"	4589
"									no	"	"					"	"	4590
"	no							8 00	yes	"	"					"	"	4591
"	yes	no	mort.	250	7	yes	yes		"	"	"					"	"	4592
"	no							6 00	no	"	"					"	"	4593
s-mo.	yes	no	mort.	400	7	yes	yes		"	yes	"					"	"	4594
"	no							3 00	yes	"	"					"	no	4595
wk.	"							7 00	"	no	"					"	yes	4596
"	"							3 00	"	yes	"					no	"	4597
"	"							4 50	"	no	"					yes	"	4598
"											"					"	"	4599
s-mo.	yes	yes					yes				"					no	no	4600

* Donaldson Bros. Employés Sick and Accident Benefit Association.

Book No. 93. **Table No. 1.—Continued.—*Statistics of***

Number of schedule.	Residence.	Age.	Nationality.	If foreign born how many years in the United States?	Married or single?	Number adults in family.	Number children in family.	What is the nature of your work?	Do you work by day, week, month, or on piece work?	How many hours constitute a day's work?	Do you work over time?	Average earnings per day.	Number of days' time lost in past year.	Cause of lost time.	Amount earned in past year.	Amount saved in past year.
4601	Kalamazoo.	40	Am.	----	m	2	1	Teamster...	day	10	no	$1 50	30	Lack of work	$425	$25
4602	"	45	"	----	"	2	5	" --	"	12	----	1 50	none	----------------	470	none
4603	Detroit.....	21	Pol	--	s		--	" --	"	10	no	1 20	"	----------------	376	"
4604	" -----	50	Ger.	29	m	2	3	" --	"	10	"	1 50	"	----------------	470	"
4605	" -----	47	Can.	7	"	2	1	" --	"	12	"	1 50	30	Sickness.....	425	40
4606	" -----	41	Am.	----	"	2	2	" --	wk.	10	"	1 50	none	----------------	470	100
4607	" -----	35	"	----	"	2	--	" --	"	10	yes	1 65	"	----------------	516	10
4608	Jackson....	54	"	----	"	2	1	" --	day	10	no	2 50	6	Sickness.....	768	125
4609	" ----	49	"	----	"	2	2	" --	"	10	"	1 25	60	Lack of work	316	none
4610	" ----	49	"	----	"	2	--	" --	"	10	yes	1 13	5	Sickness.....	347	"
4611	Lansing....	49	Can.	19	"	2	2	" --	"	12	no	1 50	7	" *...	459	"
4612	" ----	41	Ger.	14	"	2	4	" --	"	10	----	1 25	none	----------------	391	50
4613	" ----	27	Am.	----	"	2	1	" --	"	10	yes	1 00	60	Lack of work	253	none
4614	Ionia	22	"	----	s	--	--	" --	"	10	no	1 20	18	" "	354	"
4615	" -------	23	"	----	"	--	-	" --	"	10	"	90	78	" "	211	"
4616	Pontiac	51	"	----	m	--	--	" --	"	10	"	1 25	21	Sickness	365	"
4617	" ----	35	"	----	"	2	3	" --	"	10	"	1 25	26	" ----	359	"
4618	Three Rivers	33	Ger.	26	"	2	2	" --	wk.	10	"	1 66	none	----------------	520	125
4619	" "	44	Am.	----	"	2	3	" --	day	10	yes	1 08	6	Lack of work	332	75
4620	Albion......	34	"	----	"	2	3	" --	"	10	no	2 25	20	----------------	660	75
4621	Buchanan...	33	"	----	"	2	--	" --	"	10	"	1 50	23	Various......	435	------
4622	Lowell .	31	"	----	"	2	1	" --	"	10	"	1 50	none	----------------	470	------
4623	Mt. Clemens	26	Ger.	----	s	--	--	" --	"	10	"	1 12	4	Pleasure.....	346	none
4624	Ovid	36	Am	----	m	2	4	" --	"	10	"	1 25	105	Lack of work	260	"
4625	Wayne......	46	"	----	"	2	-	" --	"	10	"	1 75	10	Sickness.....	527	"
4626	Kalamazoo.	45	Swe.	18	"	2	8	Watchman.	"	11	----	1 25	none	----------------	391	"
4627	"	28	Am.	----	"	2	2	"	"	11	----	1 50	"	----------------	470	175
4628	"	45	"		"	2	--	"	"	11	----	1 50	"	----------------	370	150
4629	"	35	Hol.	30	"	2	1	"	"	12	----	1 50	"	----------------	470	85
4630	"	45	"	35	"	4	2	"	"	11	----	1 50	"	----------------	470	150
4631	Jackson....	36	Am.	----	"	2	1	"	wk.	12	----	1 35	"	----------------	423	------
4632	" ----	40	Irish	----	"	2	2	"	"	12	no	1 50	"	----------------	470	none
4633	" ----	21	Am.	----	s		--	"	"	13	"	1 07	100	Lack of work*	228	50
4634	" ----	57	"	----	m	5	--	"	"	12	"	1 14	12	Sickness......	343	none
4635	Lansing....	45	"	----	"	2	2	"	"	12	"	1 07	50	Lack of work	281	"
4636	" ----	50	"	----	"	2	--	"	"	12	----	1 50	none	----------------	547	100
4637	" ----	55	"	----	"	2	--	"	day	12	no	1 35	7	Sickness.	483	120
4638	Pontiac	19	"	----	s	--	--	"	wk.	12	yes	1 25	157	" ----	195	none
4639	" ----	46	"	----	m	5	2	"	day	12	----	1 37	none	----------------	429	"
4640	" ----	49	Fr.	----	s		--	"	"	12	----	1 25	"	----------------	391	100
4641	Detroit.....	30	Am.	----	m	2		"	wk.	12	no	1 50	60	Lack of work	380	100
4642	" -----	54	Ger.	18	"	4	1	"	mo.	12	"	1 50	none	----------------	470	100
4643	" -----	50	Aus.	9	"	2	2	"	day	12	"	1 25	"	----------------	456	none
4644	Coldwater .	50	Am.	----	"	2	--	"	wk.	12	----	1 10	"	----------------	344	"
4645	Three Rivers.	54	"	----	"	2	4	"	"	12	no	1 43	"	----------------	448	"
4646	G'd Rapids.	55	"	----	"	2	1	"	day	13	"	1 00	286	Lack of work	27	"
4647	Wayne......	25	Ger.	21	s		-	"	"	13	"	1 00	none	----------------	313	"
4648	Ovid	50	Can.	7	w	1	7	"	"	10	"	1 50	"	----------------	470	------
4649	Albion.. ...	45	Am.	----	m	2	3	"	"	----	"	1 25	75	Lack of work	298	125
4650	Buchanan...	48	"	----	"	2	3	"	"	10	"	1 50	30	Various......	426	------

* And pleasure.

employés of manufacturers of vehicles.

How often are wages paid?	Do you own your home?	Is it clear of incumbrance?	If not clear, is debt on contract or mortgage?	How much is the debt?	What rate of interest do you pay?	Do you meet the payments?	Is it insured against fire?	If renting, how much per month?	Have you life insurance?	Have you accident insurance?	To what labor organization do you belong?	Has it a funeral benefit?	Has it a sick benefit?	Has it a strike benefit?	Does its effect increase wages?	Do you favor restricting foreign immigration?	Does foreign immigration injure your present occupation?	Number of schedule.
wk.	no										None					yes	yes	4601
"	"							$6 00			"					"	"	4602
s-mo.											"					"	"	4603
"	yes	no	cont.		7	yes	yes		yes	no	"					"	"	4604
wk.	no							7 00	"	"	"					"	"	4605
s-mo.	"							8 00	no	"	"					"	"	4606
wk.	yes	no	mort.	$600	7	yes	yes				"					"	"	4607
"	"	"	"	200	7	"	"		yes	no	"					"	"	4608
"	no							7 00	no	"	"					no	"	4609
"	yes	yes					no				"					yes	"	4610
"	no							5 50	yes	yes	"					"	"	4611
"	yes	no	mort.	200	7	yes	yes		"	no	"					"	"	4612
"	no							5 00			"					"	"	4613
s-mo.									yes	no	"					"	"	4614
"									no	"	"					"	"	4615
wk.	no							13 00	"	"	"					"	"	4616
"	"							4 00			"					"	"	4617
"	"							5 00	yes	no	"					"	no	4618
"	yes	no	mort.	375	6	yes	yes		no	"	"					"	yes	4619
"	no							8 00	yes	"	"					"	"	4620
s-mo.	yes	no	mort.	300	7	yes	yes		"	"	"					"	"	4621
mo.	"	"	"	350	7	"	"		"		"					"	"	4622
wk.											*	no	yes	no	no	"	"	4623
s-mo.	no							4 00			None					"	no	4624
"	yes	no					no				"					no	"	4625
wk.	"	yes									"					"	"	4626
mo.	no							6 00			"					yes	yes	4627
wk.	yes	yes					yes				"					"	"	4628
"	no							6 00			"					"	"	4629
"	yes	yes					yes				"					"	"	4630
s-mo.	no							4 00			"					"	"	4631
wk.	yes	yes							yes	no	"					"	"	4632
"									no	"	"					"	"	4633
"	no							10 00	"	"	"					"	"	4634
s-mo.	"							5 00			"					"	"	4635
wk.	yes	no					yes		yes	yes	"					"	"	4636
s-mo.	"	"	cont.	300	7	yes	"				"					"	"	4637
wk.	no							8 00	no	no	"					"	"	4638
"	yes	no	mort.	300	8	yes	no		yes		"					"	"	4639
"									"		"					"	"	4640
s-mo.	no							7 00	no	no	"					"	"	4641
mo.	yes	yes					yes		"	"	"					"	"	4642
s-mo.	no							6 00	"	"	"					"	"	4643
wk.	yes								"	"	"					"	"	4644
"	"	yes					yes				"					"	no	4645
"	"	"					"		no	no	"					"	yes	4646
s-mo.											"					"	"	4647
"	yes	no	cont.	50	7	yes	no			no	"					no	no	4648
"	"	"	mort.	400	6	"	yes		yes	"	"					yes	yes	4649
"	no							8 00			"					"	"	4650

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* Donaldson Bros'. Employés Sick and Accident Benefit Association.

DEDUCTIONS FROM TABLE NO 1.

The statistics from this class of labor were gathered from 4,650 employés of vehicle manufacturers. They embraced all grades of labor entering into any part of the manufacture of vehicles, from the superintendent to the common laborer. Some of the forty-four questions asked are not included in the table, as they would extend it over two pages in space, but the footings of the entire schedules are used in these deductions. The information gathered as to an eight hour day for labor appears in another place.

RESIDENCE.

Those who were canvassed reside in forty-one places in various parts of the State, about 75 per cent being at Kalamazoo, Jackson, Grand Rapids, Detroit, Flint, Pontiac and Lansing, the central points of the vehicle industry in the State. The other 25 per cent are from thirty-four different towns located in all parts of the State, as follows:

Kalamazoo	840
Jackson	673
Grand Rapids	636
Detroit	436
Flint	375
Pontiac	217
Lansing	210
Three Rivers	143
Charlotte	135
Marshall	112
Ionia	93
Linden	77
Wayne	73
Bay City	59
Ovid	55
Coldwater	53
Jonesville	49
Albion	48
Lowell	41
Buchanan	37
Saginaw	35
Battle Creek	32
Mt. Clemens	31
White Pigeon	28
Manistee	26
Owosso	26
Traverse City	18
Monroe	11
Northville	10
Allegan	8
Rochester	6
Benton Harbor	6
Iron Mountain	4
Lapeer	4
Plymouth	4
Romeo	4
Escanaba	3
Wyandotte	2
Roseville	1
Ypsilanti	1
South Lyon	1
Whole number canvassed	4,650

AGE.

Number giving age	4,644
Number not giving age	6
Whole number canvassed	4,650

Aggregate of ages given	140,926 years
Average age of employés	30⅓ years

This class of laborers are in the very prime of life. Not many have passed the so-called meridian, and but very few have not reached years of maturity.

NATIVITY.

These people represent twenty-four different nationalities, the following showing the number of each, the per cent of the leading ones being given below:

Americans	3,315	Danes	5
Germans	449	Norwegians	5
Canadians	288	Prussians	4
Hollanders	208	Austrians	3
Irish	122	Finns	2
English	84	Italians	2
Polanders	48	Welsh	1
French	34	Netherlander	1
Scotch	33	Belgian	1
Swedes	23	Russian	1
Bohemians	6	Jew	1
Swiss	6	Not answering	8
Whole number canvassed			4,650

It will be seen that over 71 per cent of this class of labor are American born, the Germans coming next with less than 10 per cent, while the Canadians and English combined have only 8 per cent. All other nationalities mentioned represent only 11 per cent of those canvassed.

Assuming that four of the eight not giving their nationalities are Americans, the number of foreigners canvassed would be 1,331, or a little less than 29 per cent.

Number of foreigners giving time of residence in this country	1,036
Number not answering	295
Whole number of foreigners canvassed	1,331

Aggregate of years in this country	17,334
Average years for each person	16¾

It must be assumed that a large per cent of those not giving time of residence in this country were either born here of foreign parents or that they were so young when they came that they are practically Americans. It is thus competent to say that 75 per cent, or three-fourths of this class of labor are Americans, and that the foreign-born laborer does not enter largely into this great manufacturing industry in this State, and that those who are foreign-born have lived here on the average of nearly seventeen years each.

SOCIAL CONDITION.

Number married	2,457
Number single	2,144
Number widowed	47
Number not answering	2
Whole number canvassed	4,650

Number of adults in families	5,209
Number of children in families	2,069
Whole number in families	7,278

This shows that of those canvassed nearly 53 per cent were married, 46 per cent were single and about 1 per cent were widowed; a nearly equal division between those that have families and those without. The families aggregate 7,278 persons; over 71 per cent being adults, and less than 29 per cent children. Among those who were single there were twenty-six who supported families.

WHERE EMPLOYED.

As before indicated, these establishments were located in forty-one different towns and cities. In some instances but very few employés were at work; even in large establishments the number was cut to the smallest effective limit. No establishment was found running full handed.

Number of manufacturing establishments canvassed	122
Average number to each establishment	38
Whole number canvassed	4,650

NATURE OF WORK AND AVERAGE WAGES.

It was intended to canvass, as near as possible, a proportionate number of the different classes of labor entering into the manufacture of vehicles, but on account of many of the establishments being partly closed it was found impossible to do so, as some grades of employés were nearly or entirely laid off, while in others the full number were at work. Enough were found to give good statistics of each class of work, and the average wages paid in each class. The answers shows 104 classifications, which with the number canvassed in each class and the average daily wages are given below:

	Average wages.
13 managers	$3 92+
36 superintendents	3 77+
84 foremen	2 57+
2 overseers	2 50
19 stenographers	1 28+
24 bookkeepers	2 26+
1 cashier	2 00
12 salesmen	3 83
12 clerks	1 27+
4 timekeepers	1 27
24 office work	2 02
89 shippers	1 39
21 stockkeepers	1 38
7 inspectors	1 55
3 lumber scalers	1 58+
5 draughtsmen	2 40+
2 designers	2 90
53 engineers	1 21+
11 firemen	1 19+
443 wood workers	1 67+
28 iron workers	1 37+
585 machine men	1 50+
439 blacksmiths	1 75
864 painters	1 52
56 wheelmen	1 42+
50 spring makers	1 77+
8 spring fitters	2 02
2 band sawyers	1 37+
19 frame workers	1 79+
15 setting up work	1 40
89 finishers	1 61+
372 trimmers	1 59+
8 toolmakers	2 58
30 molders	1 42+
96 filers	1 34+
28 benchmen	1 38+
4 seat makers	1 33+
2 leather workers	1 00
3 lacers	1 45
23 stitchers	92+
2 pasters	70
74 polishers	1 93
19 sanders	$1 20
16 benders	1 50+
9 buffers	1 08+
2 welders	1 87+
4 rimmers	1 61+
2 rollers	1 75
1 riveter	1 10
18 platers	2 28+
3 japaners	2 50
3 brazers	1 97+
3 solderers	1 13
15 gluers	1 18+
7 brushmakers	1 19+
16 geerworkers	1 46+
22 tire setters	1 30
15 repairers	1 72
23 assemblers	1 61+
7 rubbers	1 12+
2 enamelers	1 73+
4 varnishers	1 25
3 stripers	1 58+
1 scroller	1 60
1 grainer	95
2 decorators	2 25
1 grader	1 65
4 spoke fitters	94
1 skein fitter	1 35
1 tester	1 37
1 cleaner	66
1 box setter	1 85
1 upholsterer	80
1 cushion maker	2 25
1 top maker	1 75
1 core maker	1 04
1 pedal maker	1 50
1 case hardener	1 50
1 bed worker	2 00
1 marker	85
1 mason	3 00
163 helpers	1 12+
54 apprentices	74+
2 elevators	1 00

	Average wages.		Average wages.
26 reed workers	$0 82+	1 porter	$1 00
102 craters	1 20+	44 various work	90+
12 packers	1 10+	4 office girls	1 31+
3 turners	1 63+	8 office boys	85+
4 shapers	1 67+	2 dusters	1 50
5 cutters	1 25	3 sweepers	57+
4 planers	1 22+	21 yardmen	1 02+
12 spoke drivers	1 71+	268 laborers	1 19+
8 drillers	1 54+	38 teamsters	1 38+
13 grinders	1 66+	25 watchmen	1 32+

Average daily wages for the entire number canvassed...... 1 55

HOW EMPLOYED AND HOURS PER DAY.

Number giving hours of labor per day	4,621
Number not giving hours of labor per day	29
Whole number canvassed	4,650

Aggregate hours per day	46,239
Average hours per day	10

Number who work by the day	3,147
Number who work by the piece	1,154
Number who work by the week	265
Number who work by the year	39
Number who work by the month	27
Number who work by the hour	5
Number not answering	13
Whole number canvassed	4,650

It will be seen that although these employés are engaged in 104 different kinds of work, their average day's work is 10 hours, and that over 67 per cent of them are employed by the day; less than 25 per cent work by the piece, and a little over 5 per cent by the week, the others being employed by year or month. These latter are principally managers, superintendents or salesmen. Working by the day seems to be the most acceptable for employer and employé, although from the nature of vehicle work about one-quarter of the employés are engaged on piece work.

WAGES.

Every person canvassed answered as to the amount earned each day, the aggregate being $7,205.78, an average of $1.55 for each employé.

Number who can earn more than enough to support themselves and families	812
Number who cannot	1,676
Number not answering	41
Whole number who support families	2,529

This shows that of those who have families to support 32 per cent earn more than enough for that purpose, while 66 per cent say that they cannot, about 2 per cent not answering. From this it will be seen that about two-thirds of these employés could not earn more than a bare support for themselves and families during the year.

LOSS OF TIME.

Number who lost time during the year		3,759
Number who did not lose time during the year		891
Whole number canvassed		4,650
Aggregate days' time lost	217,374	
Average days' time lost for each	58	

This shows that about 81 per cent of those canvassed lost 217,374 days' time during the year, an average of about 58 days each, while 19 per cent lost no time. Below is shown the various causes for this enforced idleness. It also answers the question, why so large a per cent of these people could not earn more than enough to support themselves and families.

CAUSES FOR LOST TIME.

Lack of work	2,631
Sickness	554
Vacation	140
Pleasure	125
Other business	70
Laid off	53
Holidays	34
At school	21
Accidents	10
Various causes	28
Not answering	103
Whole number losing time	3,759

It will be seen that 70 per cent of the above lost time from a lack of work. The number of days lost for this cause aggregates over three-quarters of the entire loss. Nearly 15 per cent lost time on account of sickness. About 4 per cent say their time was lost on account of taking a vacation, while 3 per cent more say theirs was for pleasure. There were various other causes given for lost time, but the great bulk of time lost was by reason of lack of work, sickness or pleasure. It is safe to assume that the 53 who say they were "laid off" were all or nearly all laid off for lack of work. Nearly 3 per cent of those losing time gave no reason therefor.

EARNINGS AND SAVINGS.

Number giving earnings		4,650
Aggregate earnings	$1,985,446 00	
Average earnings, each	426 98	
Number who saved money, during the past year		1,549
Number who did not save money		2,855
Number not answering		246
Whole number canvassed		4,650
Aggregate amount saved	$185,998 00	
Average amount saved by each who saved	120 07	

Each person canvassed gave the amount of their earnings, the aggregate and average for each being given above. They are small as compared with what this great industry would be were it not so seriously crippled by the widespread industrial depression.

Over 33 per cent say they saved money during the year, while 61 per cent say they did not. About 6 per cent do not answer. The deductions show that the savings were small, averaging only about $120 to each person saving.

OVERTIME.

Number who work overtime	1,192
Number who do not work overtime	2,819
Number not answering	639
Whole number canvassed	4,650
Number who receive extra for overtime	1,058
Number who do not receive extra for overtime	114
Number not answering	20
Whole number who work overtime	1,192

Number who say overtime pay is the same rate as regular time..	868
Number who say it is more	168
Number who do not answer	22
Whole number who receive extra for overtime	1,058

From the above it will be noted that more than 25 per cent of those canvassed say that they work overtime; over 60 per cent say they do not, while about 14 per cent do not answer.

Of those who work overtime over 88 per cent say they receive extra pay for such work, about 10 per cent say they do not, and 2 per cent do not answer.

Of those who receive extra for overtime, 82 per cent say it is at same rate as regular time, nearly 16 per cent say it is at a higher rate, about 2 per cent not answering.

WHEN WAGES ARE PAID.

Number who say wages are paid weekly	3,104
Number who say wages are paid semi-monthly	1,239
Number who say wages are paid monthly	259
Number who say wages are paid on demand	9
Number who say wages are paid daily	1
Number who say wages are paid quarterly	1
Number who say wages are paid bi-monthly	1
Number not answering	36
Whole number canvassed	4,650

Number who say wages are withheld under certain rules	751
Number who say they are not so withheld	3,767
Number not answering	132
Whole number canvassed	4,650

By the above it will be seen over 66 per cent of those canvassed are paid weekly, over 26 per cent are paid twice each month, about 5 per cent are paid monthly, while a few are paid on demand. The canvass showed only one who was paid daily, one once in two months and one every three months.

Over 16 per cent report that their wages are withheld under certain rules, 81 per cent saying they are not so withheld, while 3 per cent do not answer. It is probable there may have been some misunderstanding as to this question, but it is certain that as a rule employers do not withhold the pay of their employés, only from one week to another that their books may be properly adjusted, as entries cannot always be brought down to the regular pay day.

AS TO TIMES.

Number who say that times are better than two years ago	894
Number who say times are worse than two years ago	2,501
Number who say they are the same	1,138
Number who do not answer	117
Whole number canvassed	4,650

Number who say that times are better than one year ago	679
Number who say that times are worse than one year ago	2,195
Number who say they are the same	1,617
Number who do not answer	159
Whole number canvassed	4,650

From this it will be seen that only 19 per cent of these employés say that times are better than two years ago, while 53 per cent say they have grown worse in that period. Over 24 per cent say they are the same, and 4 per cent do not answer.

Regarding times for the period of one year, a little over 14 per cent say they are better, while 47 per cent say as emphatically that they are worse. Over 34 per cent think they have not changed. About 5 per cent give no answer.

This would indicate that over one-half of these employés think that times are worse than they were two years ago, and a little less than half think they are worse than they were one year ago. About one-quarter of them think they are the same as two years ago, while one-third of them think they remain as they were one year ago. A few of the more favored ones report times as better than two years ago, while a less number report them better than one year ago. The canvass of these employés does not show any betterment of times for the periods mentioned.

AS TO LIVING.

Number who say cost of living has increased in two years	950
Number who say it has not increased	1,159
Number who say it is the same	2,318
Number who do not answer	223
Whole number canvassed	4,650

Number who say cost of living has increased in past year	850
Number who say it has not	976
Number who say it is the same	2,541
Number who do not answer	283
Whole number canvassed	4,650

These answers indicate that over 20 per cent think the cost of living has increased in the past two years, while 24 per cent say it has decreased in that period. About one-half say there has been no change. About 7 per cent did not answer.

For the period of one year nearly 19 per cent think there has been an increase, while about 21 per cent think there has been a decrease. Over 54 per cent think there has been no change. A little over 6 per cent do not answer.

The answers show that taken as a whole there has been no material change in the cost of living in either period mentioned. In some localities in the State it is probable there has been a slight increase, while other localities more than offset it with a decrease. A majority from all sections report that there has been no change.

AS TO HOMES.

Number who own their homes	1,138
Number who do not own their homes	1,487
Number who do not answer	2,025
Whole number canvassed	4,650

Number whose homes are clear from incumbrance	549
Number whose homes are not clear from incumbrance	568
Number who do not answer	21
Whole number who own homes	1,138

Number where debt is on mortgage	353
Number where debt is on contract	170
Number who do not answer	45
Whole number of homes incumbered	568

Number giving indebtedness	521
Number who do not give indebtedness	47
Whole number of homes incumbered	568

Aggregate amount of indebtedness	$222,709 00
Average for each home incumbered	429 30

Number who give rate of interest	529
Number who do not give rate of interest	39
Whole number paying interest	568

Average rate of interest, nearly 7 per cent.

Number who meet the payments	494
Number who do not meet the payments	44
Number who do not answer	30
Whole number of homes incumbered	568

Number who keep their homes insured	1,023
Number who do not keep their homes insured	65
Number who do not answer	50
Whole number who own homes	1,138

Number who rent homes	1,332

Aggregate monthly rental	$9,631 25
Average monthly rental for each	7 03

It will be seen that of those supporting families only about 44 per per cent own their homes, showing that a majority rather pay rent than taxes and insurance. Only a very small per cent of the unmarried support families, most of those who are single not answering the question relative to homes.

Of those who own homes about one-half are clear from incumbrance. Of those in debt for homes about 63 per cent are secured by mortgage, the other 37 per cent being on contract. Over 91 per cent of those in debt gave the amount of indebtedness and rate of interest, the others not answering.

The indebtedness is not large, averaging less than $430 each, the annual interest being a little less than 7 pr cent per annum. Of those in debt for homes over 87 per cent meet their payments, which certainly is a good showing for these people, there being less than 13 per cent who do not meet their payments. This is certainly most commendable for these employés, for when we consider the stringency of the times, together with the great loss of time through lack of work, it would not be surprising that many more had failed to meet their obligations.

The manner in which those owning homes provide against casualties by fire also speaks of their thrift and care. Over 90 per cent keep them insured against fire, only 5 per cent saying they do not, the others not answering. Assuming that those who do not answer are also negligent in this direction, it makes less than 10 per cent who do not show thrifty managament as to fire insurance.

Over 50 per cent of those supportng families rent their homes. In many instances they are not able to purchase a home, even by making the first small payment. Then again, when the use of money is considered, and insurance, taxes and repairs computed, renting has been found preferable, especially when the employment of labor has been so uncertain.

The question of homes for laboring men always has and always will be an important one for the student of political economy. The figures given above can but be interesting and instructive.

FRATERNAL ORGANIZATIONS AND INSURANCE.

Number who belong to fraternal organization	1,596
Number who do not belong to fraternal organizations	3,052
Number who do not answer	2
Whole number canvassed	4,650
Number who have fraternal life insurance	1,184
Number who do not have fraternal life insurance	317
Number who do not answer	95
Whole number who belong to fraternal organizations	1,596
Number who have other life insurance	558
Number who do not have other life insurance	2,546
Number who do not answer	1,546
Whole number canvassed	4,650
Number who have accident insurance	307
Number who do not have accident insurance	2,471
Number who do not answer	1,872
Whole number canvassed	4,650

By these answers it will be seen that only a little over 34 per cent of those canvassed are members of fraternal societies, about 66 per cent saying they do not belong to such organizations.

Of those who do belong over 75 per cent say there is life insurance attached to the organization to which they belong. About 20 per cent say they have no fraternal insurance, the other 5 per cent not answering.

There are 74 different designations returned for the societies to which these employés belong, over 35 per cent of the 1,184 being members of Maccabees, showing that far more of this class of laborers are members of this order than any of the other fraternal organizations in the State. The Masons, Odd Fellows, United Workman, Foresters, and Modern Woodmen come next in the order named, each having from 10 to 15 per cent of this membership.

Regarding other life insurance, the reports show that over 12 per cent of these employés are insured outside of fraternal organizations. Over 54 per cent of those canvassed say they have no such insurance, while 33 per cent do not answer the question. This does not indicate the utmost providence on the part of these employés in providing for the future of their families in case death should overtake them. Probably in the stringency of the times many do not feel able to secure a policy and keep up the premiums. This is unfortunate. The wage earner too often leaves his family unprovided for.

In the matter of indemnity against accidents, a still less number are protected. Less than 7 per cent carry accidental policies. Over 54 per cent say they have no accident insurance and 40 per cent do not answer. It would seem that laborers who are working more or less around machinery would indemnify themselves and families against accidents, especially as rates for such insurance are low and premiums made payable in a manner that a person with limited means can ordinarily meet. Accidents often occur, leaving the injured and his family to be cared for by public aid or private charity.

LABOR ORGANIZATIONS AND BENEFITS.

Number who belong to labor organizations	391
Number who do not belong to labor organizations	4,259
Whole number canvassed	4,650
Number who say there is a funeral benefit with such organization	57
Number who say there is not	184
Number who do not answer	150
Whole number who belong to labor organizations	391

Number who say there is a sick benefit	90
Number who say there is not a sick benefit	147
Number who do not answer	154
Whole number who belong to labor organizations	391

Number who say there is a strike benefit	84
Number who say there is not a strike benefit	146
Number who do not answer	161
Whole number who belong to labor organizations	391

Number who say that the effect tends to increase wages	183
Number who say it does not	63
Number who do not answer	145
Whole number who belong to labor organizations	391

It will be seen that of the entire number canvassed only a little over 8 per cent belong to labor organizations. Over 91 per cent say they do not belong to such organizations.

This is remarkable, as almost every branch of skilled labor has some union or labor organization claimed to be for the benefit of those eligible to membership, and the general impression is that a large per cent of working men avail themselves of whatever good there may be in such organizations. The inquiry in this direction discloses otherwise.

The answers indicate 32 different associations and unions to which these 391 employés belong, the largest membership, 33 per cent, being in the Wheelmakers Union. The Brotherhood of Bicycle Mechanics has about 20 per cent; Carriage and Wagon Makers' Union, 11 per cent; Metal Polishers' Union, 10 per cent. All other organizations named have only a few members each.

While membership in these organizations embraces only a small per cent of the 4,650 employés canvassed, their answers also indicate that very little benefit is claimed for such membership. It will be seen that less than 15 per cent say there is a funeral benefit; less than 24 per cent claim a sick benefit; only 22 per cent claim a strike benefit, and less than one-half of the 391 say the effect of such organizations tends to increase wages. Perhaps with the small benefits coming to the members it is not, after all, so remarkable that so few join these organizations. The modern student, who has the benefits of labor organizations under consideration certainly has an interesting theme for study in these questions and answers.

FOREIGN IMMIGRATION.

Number who favor restricting foreign immigration	4,093
Number who do not favor restricting foreign immigration	481
Number who do not answer	76
Whole number canvassed	4,650

Number who say foreign immigration injures their occupation	3,632
Number who say it does not injure their occupation	839
Number who do not answer	179
Whole number canvassed	4,650

While 29 per cent of those canvassed are foreign born, 88 per cent are in favor of restricting foreign immigration, showing that as a rule when the foreign-born laborer is once settled in this country and assimilated with its labor he is as emphatic against foreigners coming to the land of his adoption as his native born co-worker. Only about 10 per cent did not favor restricting foreign immigration. As compared with statistics gathered in previous years, the sentiment grows more manifest against foreign immigration. Those who are studying the labor question can but see that an important factor in its solution lies in the direction of restricting foreign immigration.

As to whether foreign immigration injures their present occupation or not, 78 per cent of the 4,650 think that it does, while 18 per cent think otherwise. Only about 4 per cent did not answer. While some who favor restricting foreign immigration do not think such immigration injures their present occupation, they do think it injures the American laborer. Their own particular occupation may not come in direct contact with the foreign laborer who comes to this country, but they feel that there is danger that it may be so, and the American born laborer is no more decided on his views on this question than is his co-worker who was born in a foreign country. The condition of labor for the past few years causes all classes of labor and those who have its interests at heart to look with the gravest suspicion on any surplus labor coming from a foreign country.

STATISTICS OF MANUFACTURERS OF VEHICLES.

The Michigan Bureau of Labor and Industrial Statistics has published statistics of the condition of a large number of the employés of many different industries in the State. Each year since the Bureau was established, in 1883, it has canvassed a different industry. Commencing with the eleventh annual report, it has not only published statistics of the people employed in a certain industry, but also statistics gathered from the employers in that industry.

For the fourteenth annual report, a canvass has been made of people engaged in the manufacture of the many different vehicles for the transportation of passengers or freight outside of railroads and watercraft. Table I, and the deductions following it, are devoted to these statistics.

A canvass has also been made of these vehicle manufacturers, with the intention of showing the magnitude of this branch of Michigan manufacturing. Under the term "vehicle" is included all kinds of carriages, wagons, sleighs, bicycles, carts, wheelbarrows, children's wagons, and hand sleds. Some establishments manufacture only parts of a vehicle, such as spokes, hubs, springs, etc. These are all classed in this report as "vehicle manufacturers." The result of the canvass is shown in Table II and the deductions following it.

One hundred and twenty-six establishments were canvassed in 41 cities and villages. In this number of establishments are 46 incorporated companies, 39 partnerships and 41 doing an individual business. The capital invested in the business amounts to $4,626,553, and employment is given to 6,243 people. The average monthly pay roll is $231,911. The value of the raw material used is reported at $3,674,717, and the value of the product—jobbing prices—is given as $8,044,222. An examination of the table will show that over 63 per cent of this product is sold outside of Michigan, and that shipments are made to many foreign countries. It is perhaps needless to say the quality of the Michigan manufactured vehicles is unsurpassed either in material or workmanship. Michigan stands second to none. The table in this respect includes a number of firms who do other manufacturing and in addition manufacture bicycles, sleighs, cutters and parts of carriages or other vehicles. Beside the product given here there are in the aggregate a large number of wagons, carriages, sleighs, etc., manufactured by persons carrying on a general blacksmith business. Indeed, there is scarcely a village or hamlet in the State that does not turn out more or less of this kind of product. The capital invested, people employed, are not easily estimated, apart from the other business. Satisfactory information of this could not be obtained without a personal visit to the smaller villages of the State by an agent of this Bureau. The appropriation would not warrant this extra expenditure.

The vehicle industry has been a common sufferer with nearly every other business by reason of the business depression of the past three years. As a result many plants have run on part time, with a reduced force, and some have closed down entirely.

Regarding the value of material used, the product of the business and aggregate pay-roll as tabulated it should be said that no account has been taken of the cost of the plant and machinery used, much of which is expensive, nor the loss from the use of the same. When this and the amount of bad debts and other sources of loss, together with taxes, insurance and other "fixed charges" are taken into consideration, it will readily be seen that only a small per cent of dividends can be declared. Aparently, proprietors of these establishments are holding on, hoping for better times in the future. A full share of the business failures in the past year may be found among this class of manufacturers.

Following is the form of the schedule used in making this canvass:

MICHIGAN BUREAU OF LABOR AND INDUSTRIAL STATISTICS, 1896.

STATISTICS FROM MANUFACTURERS OF VEHICLES.

Location ....
Corporation, partnership or individual business..........................
If a corporation, amount of capital stock................................
Number of shares of stock...
Amount of capital invested in the business..............................
Number of employes in shops...
Number of salaried officers and clerks..................................
Number of traveling salesmen and other employés not enumerated above..........
Average monthly pay-roll of employés in shops...........................
Average monthly pay-roll of salaried officers and clerks................
Average monthly pay-roll of traveling salesmen and other employés not enumerated above ....
Total average monthly pay-roll..

WAGONS.

Number of farm wagons (double) manufactured in 1895........................
Number of farm wagons (single) manufactured in 1895........................
Number of platform spring wagons manufactured in 1895....................
Number of express wagons manufactured in 1895.............................

Number of delivery wagons manufactured in 1895..............................
Number of other wagons manufactured in 1895, classified as follows:.............
....
....
....

CARRIAGES AND BUGGIES.

Number of top carriages (double) manufactured in 1895.........................
Number of open carriages (double) manufactured in 1895......................
Number of top buggies (single) manufactured in 1895..........................
Number of phaetons manufactured in 1895...................................
Number of traps manufactured in 1895......................................
Number of surrys manufactured in 1895.....................................
Number of phaetons manufactured in 1895...................................
Number of road carts manufactured in 1895.................................
Number of other carriages or buggies manufactured in 1895, classified as follows:..
....
....
....

MISCELLANEOUS WHEELED VEHICLES.

Number of hacks manufactured in 1895......................................
Number of omnibuses manufactured in 1895..................................
Number of mail carts, trucks or buggies manufactured in 1895..................
Number of drays manufactured in 1895......................................
Number of mill trucks manufactured in 1895.................................
Number of push carts or other hand vehicles manufactured in 1895..............
Number of wheelbarrows manufactured in 1895...............................
Number of bicycles manufactured in 1895....................................
Number of dump carts manufactured in 1895.................................
Number of other wheeled vehicles manufactured in 1895, classified as follows:....
....
....
....

SLEIGHS AND CUTTERS.

Number of pairs of bob sleighs manufactured in 1895...........................
Number of pleasure sleighs (bobs) manufactured in 1895........................
Number of double cutters manufactured in 1895..............................
Number of single cutters manufactured in 1895...............................
Number of sets of runners for carriages manufactured in 1895..................
Number of other runner vehicles manufactured in 1895, classified as follows:......
....
... .
....

STATISTICAL INFORMATION.

Value of material used in 1895..
Value of product of business in 1895......................................
What per cent of your product is sold outside of Michigan?....................
What per cent of your product of 1895 is unsold?............................
To what foreign countries do you ship your products?.........................
....
Do you favor an eight hour day for your employés?
If so, do you favor a corresponding reduction in wages?.......................
Do you think employés can accomplish as much work in 8 hours as in 10?.........

REMARKS.

....
....
....
....

Book No. 1.

Table No. 2.—*Statistics from*

Number of schedule.	Corporation, partnership, or individual business.	If a corporation, amount of capital stock.	Number shares of stock.	Amount of capital invested in the business.	Kind of vehicles or parts of vehicles manufactured.	Number of vehicles or parts of vehicles manufactured.
1	Corp.	$100,000	10,000	$125,000	Bicycles	5,300
2	"	50,000	5,000	15,500	Bob sleighs, and farm, delivery and platform wagons	2,703
3	"	350,000	35,000	350,000	Farm wagons and bob sleighs	4,475
4	"	80,000	8,000	60,000	Bicycles	500
5	Ind.	....	....	4,500	"	175
6	Corp.	50,000	1,000	25,000	Wheelbarrows	30,000
7	"	20,000	800	8,191	Mill trucks	245
8	Ind.	....	....	2,000	Delivery and other wagons, bob sleighs and runners for carriages.	20
9	"	....	....	200	Buggy tops, carriage and sleigh backs and cushions	750
10	"	....	....	6,000	Carriages, phaetons and pleasure sleighs	10
11	"	....	....	700	Farm wagons, carts, buggies and sleighs	23
12	Part.	....	....	7,000	Miscellaneous vehicles and sleigh runners	89
13	Ind.	....	....	2,000	Furniture and fruit wagons, carriages and bob sleighs	68
14	Part.	....	....	8,500	Farm and delivery wagons and bob sleighs	150
15	Corp.	25,000	2,500	15,300	Bicycles	250
16	"	18,500	1,850	23,500	Baby carriages	500
17	"	30,000	3,000	30,000	Light wagons, carriages and cutters	812
18	Ind.	....	....	2,000	Baby carriages	500
19	Part.	....	....	6,000	Farm and delivery wagons, buggies and sleighs	105
20	Ind.	....	....	5,000	Baby carriages	800
21	"	6,000	none	none	Road wagon bodies and sleighs	912
22	Corp.	50,000	5,000	50,000	Wagons, carts, carriages and cutters	8,300
23	"	50,000	2,000	29,700	Wagons, trucks, carriages, carts, runners for carriages and coaster sleds.	1,122
24	Part.	....	....	50,000	Buggies and miscellaneous special carriages	132
25	"	....	....	100,000	Buggies, carriages, hacks and cutters	142
26	"	....	....	25,000	Carriage and sleigh woodwork	*a*
27	Corp.	25,000	2,500	19,000	Bicycles	450
28	Part.	....	....	22,000	Dash rails and cutter rails	175,000
29	"	....	....	12,000	Platform, delivery and express wagons, and vehicle runners	74
30	"	....	....	6,000	Express and delivery wagons, sleighs, cutters, buggies and carriages.	60
31	Ind.	....	....	5,000	Buggies	500
32	"	....	....	5,000	Delivery wagons, carriages, buggies, cutters and carriage runners.	81
33	"	....	....	3,000	Platform and delivery wagons, trucks, sleighs and runners	40
34	Corp.	25,000	3,000	25,000	Stove trucks	520
35	Part.	....	....	5,000	Farm and delivery wagons, trucks, carts and cutter runners	51
36	Ind.	....	....	3,000	Baby carriages	2,700
37	Part.	....	....	1,500	Delivery wagons and cutters	85
38	"	....	....	1,500	Platform and delivery wagons, hearses and carriages	6
39	"	....	....	1,000	Platform and delivery wagons, buggies and cutters	12
40	Corp.	....	....	....	Vehicle wheels	55,278
41	Part.	....	....	....	Spring wagons, cutters and carriages of all kinds	4,300
42	Corp.	30,000	3,000	50,000	Hand sleds	96,896

a Our business is so varied that it is impossible to give the number, as a great deal of it is unfinished *manufacturers of vehicles—Business for 1895.*

Value of material used in 1895.	Value of product of business in 1895.	Per cent of product sold outside of Michigan.	Per cent of product of 1895 unsold.	To what foreign countries do you ship your products?	Number of employés in shops.	Number of salaried officers and clerks.	Number of traveling salesmen and other employés not before named.	Average monthly pay roll of employés in shops.	Average monthly pay roll of salaried officers and clerks.	Average monthly pay roll of traveling salesmen, etc.	Total average monthly pay roll.	Number of schedule.
------	$218,000	------	none	Switz., Ger., Afr., & Sw.	267	15	3	$10,800	$983	$197	$11,980	1
$65,000	105,000	15	10	None	37	5	1	1,200	580	100	1,880	2
113,000	190,000	65	------	------	90	6	4	3,000	537	333	3,870	3
9,000	25,000	68	40	Eng.	75	1	1	2,500	100	200	2,800	4
5,250	10,500	25	none	------	20	1	1	1,000	200	100	1,300	5
20,000	33,000	90	------	------	25	1	6	650	150	100	900	6
1,005	1,357	90	------	None	20	2	none	725	175	------	900	7
219	*d* 1,246	none	20	"	2	------	"	75	------	------	75	8
1,500	3,425	"	none	"	3	------	"	140	------	------	140	9
900	1,380	"	"	------	4	------	"	240	------	------	240	10
600	1,500	------	------	------	3	------	"	130	------	------	130	11
------	------	------	------	------	8	none	"	275	------	------	275	12
2,000	4,800	25	25	------	4	------	"	160	------	------	160	13
b	*b*	none	15	None	10	1	"	300	10	------	310	14
18,000	12,000	10	15	"	30	1	"	1,125	75	------	1,200	15
4,000	6,000	90	33	"	42	2	"	1,000	143	------	1,143	16
25,000	38,000	5	10	"	20	none	"	500	60	------	560	17
3,000	5,000	66	33	"	5	"	"	150	------	------	150	18
3,500	7,500	none	none	"	9	"	"	220	------	------	220	19
------	4,800	50	20	"	15	"	4	300	------	*e*	300	20
2,500	4,500	80	none	"	none	"	none	------	------	------	------	21
100,000	900,000	90	------	Afr. and N. Z.	150	6	10	5,000	600	*e*	5,600	22
25,000	42,000	90	none	Eng., Aus., S. A., Mex. and W. I.	26	3	1	900	200	50	1,150	23
16,000	39,400	5	50	None	30	none	none	1,350	------	------	1,350	24
21,521	55,597	------	------	"	33	1	"	1,250	100	------	1,350	25
12,000	47,000	60	------	Aus., Afr., Aust., Ita., Ger., Mex., and S. A.	75	3	"	2,000	------	------	2,000	26
15,000	35,000	90	none	None	70	6	5	2,800	350	195	3,345	27
21,000	50,000	80	"	Eng., N. Z. and W. I.	40	5	2	1,250	580	160	1,990	28
7,000	19,846	5	"	None	11	none	none	512	------	------	512	29
1,500	3,490	none	50	"	10	1	"	500	40	------	540	30
c	*c*	"	------	"	15	3	5	300	150	400	850	31
12,000	21,000	"	------	"	16	none	none	600	------	------	600	32
2,800	75,000	"	------	"	18	"	"	720	------	------	720	33
6,000	20,000	75	none	"	10	2	1	400	100	200	700	34
5,275	13,195	none	"	"	12	none	none	560	------	------	560	35
948	12,750	"	"	"	4	"	"	140	------	------	140	36
525	1,875	"	10	"	9	"	"	142	------	------	142	37
1,000	3,250	"	20	"	7	"	1	225	------	60	285	38
1,500	5,000	------	------	"	6	"	none	250	------	------	250	39
100,000	261,763	25	none	"	120	2	"	4,695	175	------	4,870	40
120,000	200,000	75	10	Eng.	115	6	6	3,000	325	450	3,775	41
12,000	32,000	90	2	Can.	60	3	1	1,500	150	150	1,800	42

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[b] Can not answer as we keep no account.

[c] Manufacturer declined to give information.

[d] Men worked on repairs part of the time, which includes product of business.

[e] Work on commission.

NOTE.—Den., Denmark; Switz., Switzerland; Ger., Germany; Afr., Africa; Sw., Sweden; Eng., England; N. Z., New Zealand; W. I., West Indies; Aus., Austria; S. A., South America; Mex., Mexico; Ita., Italy; Can., Canada; Ind., India; Scot., Scotland; Aust., Australia; Rus., Russia; C. C., Cape Colony.

Book No. 2. **Table No. 2.**—Continued.—*Statistics from*

Number of schedule.	Corporation, partnership or individual business.	If a corporation, amount of capital stock.	Number of shares of stock.	Amount of capital invested in the business.	Kind of vehicles or parts of vehicles manufactured.	Number of vehicles or parts of vehicles manufactured.
43	Corp.	$90,000	9,000	$90,000	Spring wagons, buggies and carriages	1,268
44	"	100,000	4,000	92,500	Vehicle springs	36,500
45	"	100,000	4,000	300,000	Miscellaneous vehicles	12,740
46	"	100,000	10,000	100,000	Spring wagons, carriages and cutters	4,136
47	Part.	....	....	30,000	Farm wagons and bob sleighs	526
48	Ind.	....	....	3,000	Spring wagons, carriages and sewing machines	78
49	"	....	....	2,500	Carriage tops, cushions and backs	1,500
50	Part.	....	....	2,500	Bicycles	129
51	Corp.	100,000	4,000	100,000	Road wagons, buggies, carts and cutters	18,000
52	"	200,000	800	200,000	Farm wagons	3,044
53	"	100,000	....	52,000	Buggies, carriages, road wagons and cutters	1,818
54	"	32,200	3,220	32,200	Spring and delivery wagons, carriages, carts and cutters	8,850
55	"	45,000	4,500	60,000	Vehicle wheels	49,740
56	Ind.	....	....	22,000	Wagons, drays, carts, carriages, sleighs and cutters	113
57	Corp.	21,000	2,100	28,949	Vehicle springs	80,000
58	Part.	....	....	3,500	Bicycle and carriage seat handles	5,172
59	"	....	....	40,000	Spring wagons, carriages and cutters, *a*	36,250
60	"	....	....	40,000	Road wagons, buggies, carriages and cutters	2,415
61	Corp.	25,000	2,500	25,000	Spring wagons, buggies and carriages	3,980
62	Ind.	....	....	81,113	Spring wagons, buggies, cutters and carriages	8,075
63	"	....	....	25,000	Special springs	100
64	"	....	....	10,000	Phaetons	500
65	Part.	....	....	2,000	Sulkies, etc.	260
66	Ind.	....	....	....	Vehicle bodies	4,500
67	"	....	....	125,000	Buggies, carriages and carts	14,900
68	Corp.	40,000	4,000	40,000	Spring wagons, road wagons, buggies, carriages and carts.	2,941
69	"	200,000	....	50,000	Buggy springs and gears	100,000
70	"	100,000	4,000	100,000	Farm and spring wagons, buggies and carts	6,828
71	"	150,000	1,500	150,000	Spring wagons, buggies, carts and adjustable carriage poles.	11,157
72	"	80,000	3,200	107,000	Sleighs, drays, farm and delivery wagons and carriages	2,752
73	Part.	....	....	50,000	Spring wagons, buggies, carriages, cutters and runners	2,500
74	Corp.	100,000	4,000	150,000	Wheelbarrows, mill trucks, push carts and carriage runners.	66,680
75	Part.	....	....	16,000	Spokes, wheel rims and hounds	*d* 16,000
76	"	....	....	3,000	Buggies, phaetons and speeding vehicles, *b*	232
77	Ind.	....	....	4,000	Farm and spring wagons and sleighs	45
78	"	....	....	25,000	Buggies, farm and spring wagons, carts, sleighs and cutters, *c*.	170
79	"	....	....	2,500	Farm wagons and mill trucks	4
80	"	....	....	2,300	Farm and spring wagons and sleighs	74
81	"	....	....	3,500	Farm and spring wagons, road wagons, sleighs and vehicle runners.	56
82	"	....	....	12,000	Spring wagons, buggies, cutters and carriages	151
83	Part.	....	....	5,000	Bicycles	*e*
84	Corp.	50,000	5,000	69,000	Farm wagons and cutters	442

a Woodwork only.
b Also rubber cushion tires and ball bearing axles.
c Also heavy logging carts.
d 16,000 sets.
e Did not manufacture in 1895.

manufacturers of vehicles—Business for 1895.

Value of material used in 1895.	Value of product of business in 1895.	Per cent of product sold outside of Michigan.	Per cent of product of 1895 unsold.	To what foreign countries do you ship your product?	Number of employés in shops.	Number of salaried officers and clerks.	Number of traveling salesmen and other employés not before named.	Average monthly pay roll of employés in shops.	Average monthly pay roll of salaried officers and clerks.	Average monthly pay roll of traveling salesmen, etc.	Total average monthly pay roll.	Number of schedule.
$86,603	$102,259	100	none	None	40	5	30	$939	$375	$1,200	$2,514	43
23,453	43,400	30	"	"	40	4	none	1,280	282	------	1,562	44
100,000	360,000	90	"	Ger., Aus., Ind., Eng.	250	8	8	8,000	1,200	1,800	11,000	45
100,000	175,000	80	60	None	175	6	4	3,000	575	440	4,015	46
10,000	23,400	none	10	"	25	none	none	740	------	------	740	47
5,000	10,000	25	none	"	6	"	"	250	------	------	250	48
6,000	12,000	none	"	"	5	"	"	225	------	------	225	49
2,000	5,500	"	"	"	25	1	"	1,050	35	------	1,085	50
200,000	350,000	90	1	"	350	10	2	10,000	600	325	10,925	51
f	*f*	80	------	"	55	9	7	2,600	575	700	3,875	52
175,000	245,000	------	------	"	91	5	8	4,250	400	800	5,450	53
190,491	326,828	95	------	"	185	4	2	4,500	450	200	5,150	54
106,038	175,000	20	none	"	100	4	none	3,000	425	------	3,425	55
14,080	24,000	7	6	"	9	1	"	460	50	------	510	56
50,000	84,000	none	none	"	60	4	"	2,400	400	------	2,800	57
2,200	4,000	"	"	"	16	1	"	115	30	------	145	58
--------	--------	------	------	"	80	1	"	2,400	100	------	2,500	59
55,000	78,000	75	25	Eng., Scot., Ger., S. A., Sw. and Aus.	50	3	3	2,000	140	100	2,240	60
107,588	145,000	80	30	None	85	7	11	2,000	335	1,000	3,335	61
144,000	180,000	95	none	S. A.	60	4	none	1,845	182	------	2,027	62
2,000	3,000	75	"	None	15	none	"	400	------	------	400	63
25,000	34,000	75	10	"	20	1	"	400	25	------	425	64
2,000	7,000	90	12	Can.	8	1	"	240	20	------	260	65
100,000	120,000	25	none	None	100	1	"	3,500	75	------	3,575	66
285,000	363,700	95	"	"	200	6	5	4,000	600	625	5,225	67
85,721	110,879	90	"	"	45	4	none	1,200	161	------	1,361	68
--------	--------	95	"	"	10	2	"	400	140	------	540	69
128,000	210,000	85	5	"	125	6	3	4,203	611	*g*	4,814	70
--------	300,000	93	none	Ind., Aust. and S. A.	120	8	3	5,000	550	*g*	5,550	71
60,000	127,000	75	"	None	90	3	4	3,000	252	600	3,852	72
--------	--------	------	------	"	75	5	2	2,500	333	183	3,016	73
80,000	140,000	95	100	"	140	10	5	6,300	1,000	300	7,600	74
30,000	55,000	20	15	"	40	3	none	1,200	300	------	1,500	75
5,000	9,000	70	40	Ger. and Rus.	5	none	"	180	------	------	180	76
1,000	3,500	none	10	None	3	"	"	126	------	------	126	77
3,000	1,400	65	10	"	10	"	"	552	------	------	552	78
--------	--------	------	------	"	3	"	"	175	------	------	175	79
1,765	1,935	none	5	"	3	"	"	169	------	------	169	80
2,000	5,000	65	10	"	5	"	"	200	------	------	200	81
12,000	20,000	5	none	"	9	"	"	450	------	------	450	82
--------	--------	------	------	------	12	2	"	250	100	------	350	83
4,755	7,925	85	none	S. A.	50	5	"	1,000	300	------	1,300	84

f Did not answer the question.
g Work on commission.
NOTE.—Den., Denmark; Switz., Switzerland; Ger., Germany; Afr., Africa; Sw., Sweden; Eng., England; N. Z., New Zealand; W. I., West Indies; Aus., Austria; S. A., South America; Mex., Mexico; Ita., Italy; Can., Canada; Ind., India; Scot., Scotland; Aust., Australia; Rus., Russia; C. C., Cape Colony.

Book No. 3. **Table No. 2.**—Continued.—*Statistics from*

Number of schedule.	Corporation, partnership or individual business.	If a corporation, amount of capital stock.	Number of shares of stock.	Amount of capital invested in the business.	Kind of vehicles or parts of vehicles manufactured.	Number of vehicles or parts of vehicles manufactured.
85	Part.	--------	--------	$35,000	Bicycles	60
86	Corp.	$25,000	2,500	19,000	Farm wagons and drays	--------
87	"	50,000	5,000	75,000	Bicycles	1,500
88	"	50,000	5,000	50,000	Carriages and buggies	1,005
89	"	50,000	5,000	25,000	Buggies, carriages and road wagons	1,612
90	Ind.	--------	--------	32,000	Carriages, carts, road wagons and cutters	1,400
91	"	--------	--------	--------	Cutters, sleds and bicycle rims	--------
92	"	--------	--------	2,500	Speeding carts	220
93	"	--------	--------	5,000	Farm and spring wagons, sleighs, buggies and carriages	34
94	"	--------	--------	5,000	Farm and spring wagons, buggies, push carts and sleighs.	48
95	"	--------	--------	10,000	Carriages, buggies and cutters	250
96	"	--------	--------	200	Farm wagons	75
97	Part.	--------	--------	15,000	Logging and mill trucks, wagons and miscellaneous vehicles.	589
98	Ind.	--------	--------	22,000	Farm and spring wagons, buggies, sleighs, cutters and dump carts, *a*	92
99	Corp.	200,000	8,000	285,000	Velocipede and industrial cars	3,478
100	"	24,000	2,400	24,000	Buggy tops, cushions, backs, storm aprons, etc.	*b*
101	Part.	--------	--------	100,000	Carriage axles	35,879
102	"	--------	--------	40,000	Farm wagons	390
103	Ind.	--------	--------	4,000	Push carts, farm and spring wagons, sleighs and drays	89
104	Part.	--------	--------	3,000	Wagons, buggies, sleighs and cutters	24
105	"	--------	--------	45,000	Spring wagons, buggies and cutters	3,569
106	"	--------	--------	20,000	Buggies and carriages	1,150
107	Ind.	--------	--------	25,000	Wagons, buggies and sleighs	152
108	Corp.	25,000	2,500	25,000	Wagons	810
109	"	10,000	400	15,000	Trucks of all kinds	200
110	"	45,000	450	45,000	Spring wagons, carriages and cutters	2,923
111	Part.	--------	--------	50,000	Spring wagons, buggies, carriages and cutters	2,830
112	"	--------	--------	7,000	Buggies and cutters	96
113	Ind.	--------	--------	4,000	Farm and spring wagons, carriages, sleighs and cutters	121
114	Part.	--------	--------	7,000	" " " " " " " "	139
115	"	--------	--------	3,200	Spring wagons, carriages, buggies and cutters	164
116	Ind.	--------	--------	12,000	Farm and spring wagons, drays, carriages and buggies	94
117	"	--------	--------	4,000	Farm and spring wagons, drays, buggies, carriages and wheelbarrows.	86
118	Part.	--------	--------	75,000	Farm and delivery wagons, buggies, carriages, carts and sleighs.	1,606
119	Corp.	40,000	4,000	150,000	Bicycles	2,200
120	"	20,000	2,000	20,000	Spring wagons, carriages, carts and cutters, *c*	5,548
121	"	20,000	800	20,000	Wheelbarrows	8,237
122	Ind.	--------	--------	4,000	Farm wagons, buggies, push carts, sleighs and wheelbarrows.	73
123	Corp.	100,000	10,000	100,000	Farm wagons and drays	5,087
124	Part.	--------	--------	50,000	Buggies, cutters and sleighs	3,050
125	"	--------	--------	55,000	Cutters (in the white)	14,142
126	"	--------	--------	2,000	Wagons	65

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a Also 8,000 sets of vehicle runners.
b Did not give the number.
c Also 1,200 buggy bodies and 300 sets of gear woods in the white.

manufacturers of vehicles—Business for 1895.

Value of material used in 1895.	Value of product of business in 1895.	Per cent of product sold outside of Michigan.	Per cent of product of 1895 unsold.	To what foreign country do you ship your products?	Number of employés in shops.	Number of salaried officers and clerks.	Number of traveling salesmen and other employés not before named.	Average monthly pay roll of employés in shops.	Average monthly pay roll of salaried officers and clerks.	Average monthly pay roll of traveling salesmen, etc.	Total average monthly pay roll.	Number of schedule.
$1,500	$3,600	100	none	None	9	1	none	$310	$15	------	$325	85
------	------	75	"	"	15	1	1	590	48	*d*	638	86
------	90,000	90	"	"	141	5	2	4,000	487	..	4,487	87
38,201	65,226	70	4	"	50	4	1	1,200	300	$100	1,600	88
27,000	40,000	65	5	"	25	2	1	750	125	100	975	89
14,600	35,000	25	10	"	18	none	1	720	------	65	785	90
------	------	------	------	"	50	1	none	1,800	------	------	1,800	91
3,520	8,000	35	15	"	8	none	"	256	------	------	256	92
1,400	2,800	5	10	"	8	"	"	220	------	------	220	93
2,000	4,000	20	------	"	4	"	"	150	------	------	150	94
3,200	10,000	77	25	"	9	1	"	265	50	------	315	95
1,200	3,000	none	none	"	4	none	"	700	------	------	700	96
9,000	18,000	"	10	"	20	1	"	600	50	------	650	97
6,000	18,000	20	10	"	12	none	"	438	------	------	438	98
63,000	175,000	95	100	Aus., Aust., Eng., Ger., S. A., Can. and Mex.	165	11	"	5,470	1,030	------	6,500	99
33,200	53,000	90	none	Aust.	31	5	4	1,200	280	*e* 50	1,530	100
26,871	------	75	2	None	48	3	none	1,600	400	------	2,000	101
7,850	14,100	91	15	"	15	2	"	500	120	------	620	102
1,600	4,800	none	none	"	4	none	"	200	------	------	200	103
900	3,000	"	"	"	6	"	"	300	------	------	300	104
82,993	127,000	80	17	"	100	2	4	1,737	100	300	2,137	105
23,750	48,300	75	5	"	25	1	1	1,000	30	100	1,130	106
5,000	8,000	5	15	Ger.	8	1	none	285	30	------	315	107
16,000	35,000	60	none	None	32	3	2	900	150	*d*	1,050	108
1,400	4,000	100	"	C. C., Can. and S. A.	2	none	none	75	------	------	75	109
53,000	110,000	50	"	None	60	3	2	2,300	350	175	2,825	110
53,000	100,000	10	5	"	50	3	2	1,600	250	150	2,000	111
2,000	4,500	------	none	"	4	none	none	150	------	------	150	112
2,800	3,800	------	10	"	5	"	"	300	------	------	300	113
1,500	4,000	none	25	"	6	"	"	200	------	------	200	114
5,000	7,500	"	10	"	5	"	"	*f* 60	------	------	*f* 60	115
------	------	------	------	"	7	"	"	200	------	------	200	116
3,500	8,700	none	50	"	6	"	"	225	------	------	225	117
35,000	86,000	50	10	Den. and S. A.	75	4	2	2,164	620	200	2,984	118
45,000	150,000	90	------	Ger.	150	8	3	4,650	504	300	5,454	119
60,856	120,000	75	3	None	85	5	5	3,000	300	300	3,600	120
3,000	5,300	75	none	------	8	2	1	264	150	65	479	121
744	2,424	------	"	None	3	none	none	140	------	------	140	122
110,000	215,000	95	2	"	100	4	3	3,750	387	240	4,377	123
54,523	94,072	60	5	"	75	1	4	1,650	75	400	2,125	124
21,400	68,700	57	none	"	52	1	none	1,925	66	------	1,991	125
1,200	2,500	none	"	"	5	none	"	150	------	------	150	126

d Work on commission.
e Three work on commission.
f Do their own work and do not hire.

NOTE.—Den., Denmark; Switz., Switzerland; Ger., Germany; Afr., Africa; Sw., Sweden; Eng., England; N. Z., New Zealand; W. I., West Indies; Aus., Austria; S. A., South America; Mex., Mexico; Ita., Italy; Can., Canada; Ind., India; Scot., Scotland; Aus., Austria; Rus., Russia; C. C., Cape Colony.

DEDUCTIONS FROM TABLE NO. 2.

In gathering statistics from those engaged in the manufacture of vehicles or parts of vehicles all sections of the State were visited. Grand Rapids, Detroit, Kalamazoo, Jackson, Pontiac, Flint and Lansing are the greatest centers for this industry. The following shows where the factories canvassed are located:

Grand Rapids	21	Allegan	1
Detroit	18	Battle Breek	1
Kalamazoo	11	Muskegon	1
Jackson	8	Albion	1
Pontiac	7	Jonesville	1
Flint	6	Lapeer	1
Lansing	5	Utica	1
Manistee	5	Rochester	1
Saginaw	4	Romeo	1
Marshall	3	Benton Harbor	1
Owosso	2	Plymouth	1
Coldwater	2	Mt. Clemens	1
Monroe	2	Bay City	1
Linden	2	Wayne	1
Traverse City	2	Northville	1
Three Rivers	2	Wyandotte	1
Buchanan	2	Ionia	1
Escanaba	1	Ovid	1
Iron Mountain	1	Lowell	1
Charlotte	1	Howell	1
White Pigeon	1		
Whole number canvassed			126

Number of incorporated firms	46
Number of co-partnerships	39
Number doing individual business	41
Whole number canvassed	126

This indicates that of those canvassed 36½ per cent are doing business as joint stock corporations; about 31 per cent being co-partnerships, while 32½ per cent are doing an individual business.

Capital stock authorized by the 46 incorporated companies	$3,201,700 00
Average stock for each	69,602 17
Whole number shares of stock	196,520
Average number shares for each	4,272
Capital invested by the 126 establishments	$4,626,553 00
Average capital for each	36,718 67

The reports show that the business of these 126 establishments requires a capital of over four and a half million dollars—an immense outlay of money, showing that this great industry is among the first in the State. Almost every report speaks of the severe effects of the financial depression of the past few years. Scarcely an establishment was running full time or full capacity, and several of the most important ones were temporarily closed.

Number of salaried officers and clerks employed	289
Number of traveling salesmen employed	178
Number of other employés	5,776
Whole number of employés	6,243
Average number, for each establishment	49½

While the canvass shows that an average of nearly 50 persons were employed in each of these establishments, it is probable that this number would be nearly doubled were it not for the industrial depression so universal the past year. In many places extensive and costly machinery was silent for want of business, while in many others one-half of the capacity was not used.

Monthly pay roll for salaried officers and clerks	$22,321 00
Monthly average for each	77 23
Monthly pay roll of traveling salesmen	13,513 00
Monthly average for each	75 91
Monthly pay roll for other employés	196,077 00
Monthly average for each	33 94
Total monthly pay roll	231,911 00
Average monthly pay roll for each	37 12

This shows but very little difference between the average monthly pay of the salaried officers and clerks and the traveling salesmen. It does not indicate large salaries paid, the per diem averaging about $2.97.

The other employés include all shopmen, dusters, sweepers, office boys, apprentices and common laborers canvassed. The average per diem is $1.30½. Some of the better class of mechanics receive $3.00 per day, while many of the apprentices work as low as fifty cents, some of the labor being even lower than that. Considering the stringency of the times the average wages paid compares favorably with any other class of business. The general average for all employés of vehicle manufacturers, from the salaried manager to the apprentice, is about $1.43 per day.

Value of material used in 1895	$3,674,717 00
Value of product of business in 1895	8,044,222 00
Number of vehicles and parts of vehicles manufactured	814,839

Certain factories do not manufacture a vehicle complete, but work exclusively on specified parts, such as springs, wheels, runners, etc. These are put up in sets and are so counted in this enumeration.

The reports of these manufacturers show that the cost of material is a little over 44 per cent of the value of the product. When the rental value of the plant, taxes, insurance and the constant wear of machinery is added to this, together with the wages paid employés, it will be seen that the item called profit must necessarily be very small. The strictest economic management must often be used to insure success and keep their establishments in operation.

Per cent of product sold outside of Michigan	63¼
Per cent of product of 1895 unsold	19½

The product of these manufacturers is sold in all parts of the world. A glance at the table will show some of the foreign countries their goods are shipped to. Less than 37 per cent is sold inside the State. Carriages and vehicles of Michigan manufacture have a world-wide reputation. The brand of a reputable Michigan manufacturer is a guarantee which carries reliability and worth to the purchaser. It will be seen that about one-fifth of the product of 1895 was unsold at the time of making this canvass. Previous to the financial panic, commencing in 1893, orders for goods from the large factories were generally far in advance, and many establishments were obliged to work overtime to supply the demand, but like all other business, the vehicle industry has been greatly paralyzed and the sales of the past year were even less than in 1895. A study of the statistics gathered show that the Michigan vehicle manufacturer has been equally affected with other manufacturers in the great business depression.

PART II.

THE EIGHT HOUR WORK DAY.

The reduction of a day's labor to eight hours has been agitated in this country for several years. Strikes have been inaugurated to compel employers to concede this reduction. Eight hours is the rule to a certain extent in some trades at this time, but generally it is where employés "work by the piece." In a few establishments a nine hour day is maintained, the larger number, however, being still on the ten hour plan.

It is quite probable the agitation for a shorter work day will increase, and only the future will develop how the matter can be arranged.

CANVASS OF EMPLOYES.

The Michigan Bureau of Labor and Industrial Statistics deemed it a proper subject for investigation, and the following questions were asked of the employés of vehicle manufacturers canvassed:

1. Do *you* favor eight hours for a day's work?
2. Do *you* favor eight hours for a day's work with corresponding reduction in wages?
3. Do you think *you* can accomplish as much work in eight hours as in ten?
4. Do *you* think the average employé can accomplish as much work in eight hours as in ten?

In asking the above questions each person canvassed was asked to give his individual opinion, from his own observation, and not what some one had told him. The result of their answers, and deductions therefrom, are given below:

Number who favor eight hours for a day's work	3,498
Number who do not favor eight hours for a day's work	1,100
Number not answering	52
Whole number canvassed	4,650

Number favoring eight hours with corresponding reduction in wages	594
Number not favoring eight hours with corresponding reduction in wages	2,788
Number not answering	116
Whole number favoring eight hours	3,498

Number who think they can accomplish as much work in eight hours as in ten	1,067
Number who do not think they can accomplish as much work in eight hours as in ten	3,501
Number who do not answer	82
Whole number canvassed	4,650

Number who say the average man can accomplish as much work in eight hours as in ten	896
Number who say the average man cannot accomplish as much work in eight hours as in ten	3,712
Number not answering	42
Whole number canvassed	4,650

This shows that about 99 per cent of those canvassed answered these questions, and that over 75 per cent of them favored an eight hour day. It also shows that of those who favored the shorter day less than 17 per cent favor a corresponding reduction in wages. Nearly 80 per cent do not favor any reduction in wages, about 3 per cent not answering. It is evident that a shorter work day is favored by these employés, but without a corresponding reduction in wages.

The answers also show that less than 24 per cent of those canvassed think they can accomplish as much work in eight hours as in ten, over 75 per cent saying they cannot do as much. A few did not answer.

Some people doubt their own ability as to accomplishing as much work in eight hours as in ten, but think the average man can do so, over 19 per cent thus expressing themselves, but on the other hand about 80 per cent answer that the average man cannot accomplish as much in eight hours as in ten, only 42 not answering the question.

Employés were asked to express their views on the eight hour question, but out of 4,650 canvassed only 21 took advantage of the opportunity. Their comments are given below, the designating number being their schedule number in Table I, a reference to which will show where they reside.

COMMENTS OF EMPLOYES ON EIGHT HOUR WORK DAY.

91. Go ahead with your eight hour work day and give more people work, and close the ports forever to pauper immigration and open them to only those that can land here with $1,000 and show by their past record that they have been and will be prosperous and law abiding people.

128. Average man at hand work can do as much in eight hours as in ten, but cannot with machine work.

247. Of course the average man cannot do as much work in eight hours as in ten.

318. Anybody of sense would say "No" to the question "Can a man do as much work in eight hours as in ten."

335. I do not favor eight hours with wages at $1.25.

403. I favor eight hours provided I can get same pay as for ten.

487. Want a man to do 2 days' work for one-half a day's pay. No eight hours at present wages.

595. I favor eight hours with ten hours' pay.

678. I think we earn in eight hours all that we receive for ten.

680. Think it simple to ask if a man can accomplish as much work in eight hours as in ten.

854. At some occupations the average employé can do as much in eight hours as in ten, at others he cannot. I favor eight hours as it will furnish labor to the unemployed, else what help is labor saving machinery, only to fill the land with tramps, who are honest but cannot get employment.

1303. Can't do as much in eight hours as in ten on a machine.

1650. "No, decidedly not," in regard to the average employé accomplishing as much in eight hours as in ten.

1651. In adopting the eight hour day it would tend to employ more men and divide things up. I am willing to divide with some man that is idle.

3451. I am against the eight hour movement because a man cannot work in eight hours what he can in ten. After the eight hour time is adopted an employer will have to put a guard to every five men to see that he gets the amount of work done, like in the prison, and then labor organizations will squeal because they have to have a constant watchman as though in State prison.

3653. I favor eight hours a day because I think any man, if he receives a reasonable pay, can turn out as much work in eight hours as in ten hours, or have nine hours for work day and half holiday Saturday.

3764. With reference to eight hour day will say that if a workman will work honestly and try to give a square day's work, he can accomplish nearly as much in eight hours as is now done in ten, but unless they will be conscientious and willing to work steadily and with energy, they should not expect it.

3899. The question, "Can a man accomplish as much work in eight hours as he can in ten," is rather a queer question. Now if I were working eight hours a day and receiving ten hours' pay for it, I probably would say I could do as much work, but when it comes to piece work it is something else. At present I am building gears at piece work. If I stand around shooting off my mouth for five or ten minutes I soon discover that much of my time is lost for the day.

4161. Ten hours is the natural time for a healthy man to work. My wages are low enough now. Take from it 20 per cent and my part is small. I am in favor of more wages and work for it.

4613. It depends upon what the work is whether an employé can accomplish as much work in eight hours as in ten.

4638. In this part of Michigan eight hours for a day's work is all right for winter, but it should be ten in the summer.

CANVASS OF EMPLOYERS.

Wishing to get the opinion of those who employed these people, the 126 vehicle manufacturing establishments canvassed were asked these questions:

1. Do you favor an eight hour day for your employés?
2. If so, do you favor a corresponding reduction in wages?
3. Do you think employés can accomplish as much work in eight hours as in ten?

Those having these establishments in charge were asked to give these questions candid thought and to furnish the Bureau such information as they could on the subject. Their answers with the deductions drawn from the same follow:

Number who favor eight hours per day for their employés.......	32
Number who do not favor eight hours per day for their employés..	81
Number not answering	13
Whole number of manufacturing establishments canvassed...	126
Number who favor eight hours with corresponding reduction in wages	15
Number who do not favor eight hours with corresponding reduction in wages	13
Number not answering	4
Whole number favoring eight hours........................	32
Number who think employés can accomplish as much work in 8 hours as in ten	5
Number who do not think employés can accomplish as much work in eight hours as in ten	111
Number not answering	10
Whole number of manufacturing establishments canvassed...	126

It will be seen that of the 126 manufacturing establishments canvassed, 32 or over 26 per cent, favored an eight hour day for their employés, but that 15 or nearly one-half of these wanted a corresponding reduction in wages. Over 64 per cent did not favor an eight hour day. Over 10 per cent did not answer the question. It is fair to presume that those who did not answer do not look with favor on such reduction, which shows nearly 75 per cent opposing an eight hour day. Only 10 per cent of the whole number favor the shorter day with the same wages for ten hours.

Only five of all the establishments canvassed think that employés can accomplish as much in eight hours as in ten, while 111, or 88 per cent of the whole, think they cannot. Ten do not answer the question. It is evident from this that nearly all manufacturers do not think their employés can accomplish as much work in an eight hour day as in a ten hour day.

Each of these establishments were invited to express their ideas on the eight hour day question. Only 11 of the entire number canvassed accepted the invitation. Their remarks are given below, the number preceding each being their schedule number in Table II.

REMARKS BY EMPLOYERS ON AN EIGHT HOUR DAY.

1. Prefer one-half day Saturday.

18. Favor nine hours as a day's labor.

36. Favor a corresponding reduction at first, but raise to old standard after one year.

42. Think it is impossible for employés to accomplish as much work in eight hours as in ten, as machines can make but a certain number of revolutions in ten hours, and the same number cannot be crowded into eight hours.

64. Favor an eight hour work day if employés want it.

74. Favor an eight hour work day if general throughout the United States, and are willing to pay as high wages as competitors, if protected against cheap foreign labor.

76. We do not believe the same wages can be paid for eight hours as for ten, unless prices for our products are advanced. Our product is nearly all machine work. The capacity of a machine largely governs what a man can produce. The machine cannot produce as much in eight hours as in ten hours. We do not believe ten hours over-taxes a man's endurance. We also believe that many men are better off with ten hours' work than eight from a moral standpoint.

91. Favor an eight hour day if generally adopted; would be willing to try the experiment.

100. Do not think they *would* accomplish as much work in eight hours as in ten, but think they *could*.

124. Expense of heat, fuel, insurance, taxes, night watch, repairs, etc., is same for eight hours as for ten.

164. As to eight hour day, I do not see how it can be worked with satisfaction, for the simple reason we cannot see how the poor man with a team at the present scale of wages can afford to pay higher for his horse shoeing and repairing, and an eight hour day means less wages for the laboring man or higher prices for the man with team, for at the present prices it is a close shave to make both ends meet and we both work as hard as the average laboring man, the average hours for our day's work being about 13, by the time we open up in the morning until we close in the evening, as there are always books to look after and one thing and another; so I think if they favor the eight hour work day they ought to favor the business man with a little better profits.

DISCUSSION OF THE EIGHT HOUR DAY.

Believing it proper to give the reasons why the eight hour day should be adopted, Mr. Samuel Gompers, President of the American Federation of Labor, was asked to furnish an article in its favor. These questions were submitted to Mr. Gompers, as the basis for his paper, which follows:

1. What are the causes that have led to the agitation of the eight hour day?
2. What effect would the introduction of the eight hour work day have upon the interests of labor?
3. What effect would the eight hour work day have upon the interests of capital?
4. How would the eight hour work day readjust itself; that is, how would business readjust itself to the change in the hours of labor?
5. How can the eight hour day be introduced with the least friction to existing conditions?

MR. GOMPER'S PAPER.

Indianapolis, Ind., Nov. 14th, 1896.

HON. CHAS. H. MORSE, *Commissioner of Labor:*

DEAR SIR—"What are the causes that have led to the agitation of the eight hour day?"

To answer this question accurately, to treat of the movement to reduce the hours of labor, and present the subject in a fairly intelligent form, we cannot arrive at any true conclusion or present intelligently the facts in connection therewith, unless consideration is given to those elements and conditions which have, from time immemorial, gone to make up the sum total of man's activity.

At best, man does not work simply for the pleasure attained by the employment. Man works because it is necessary to his life. He recognizes the fact that unless he work to-day he may have little opportunity of living either to-day or the days to follow.

We see that in all countries where the necessaries of life are easily obtained, work is of the most primitive character, necessities are not large, opinions are not diverse, desires do not grow; enough to eat for the day is sufficient, the morrow may and will care for itself. If life remain, assurance is at hand that food and such shelter as may be essential is easily obtained and accessible. On the other hand, in those countries where climatic changes are most frequent, where the full seasons of the year, Spring, Summer, Fall and Winter, occur with great regularity and ofttimes with great severity, man is required not only to exercise his functions in order to work for the day in which he lives, but to provide shelter for the burning heat of summer and the fearful havoc of winter's cold blasts.

To these later conditions, more than to all others, are due the great progress made along economic lines leading to social, rational and moral progress. The changing seasons and varying climatic conditions gave, and still give birth to the idea among men that it is necessary to provide in one season for the severities and emergencies of the others. Perhaps to these facts more than to all else is due the great flood of light which broke through the gloom of the effete monarchical and feudal institutions with the dawn of the Nineteenth century. Official barriers were broken down, and necessity, the "Mother of invention," asserted herself; the darkness of ages had been lifted from the minds of man, and there burst forth the splendid discoveries and inventions that followed each other in quick succession. With the discovery of steam power, and the invention of machines operated by steam power, the next essential, artificial light, by which this new force—these new machines—could be utilized when the sun no longer shone on our horizon, the night, artificial light was discovered and applied.

With steam power, machinery, and artificial light, the eldorado of capitalism was at hand, and contemporaneous with that era may be counted the epoch which broke the limit of man's daily hours of labor from "Sun to Sun" and bounded at once to the highest possible limit, the maximum of human endurance.

At this period the history of the civilized world is most interesting to the student who looks for his facts, for cause and effect, beneath the gilded words of superficial writers. In the early years of the new eldorado of machinery, the rapacity of the employing class not only compelled the laborer to work all the hours that could be endured, but ruthlessly the women, the girls, the young were brought into the mills and factories to work, to work at ages which would bring a blush of shame to the cheek of the Barbarian. The "slaughter of the innocents" is not an exaggerated description of the manner in which industry was and to a great degree is still conducted, and sought to be prosperously conducted.*

It was most fortunate for the workers of the whole world that in the early days of steam and machinery, among Great Britain's titled and landed aristocracy there existed a deep rivalry and keen hatred for the manufacturers, the employers of labor, the business man. The latter were striving for the recognition of equality and that position in social, as well as economic life they were entitled to. The titled gentry regarded them as vulgar and brutal. It was while these feelings were most intense that the workers, men, women, and children were worked the hardest and longest.

It was at this time that a wail of anguish from the poorly organized and struggling workmen of England went up for relief, for help. The aristocracy of that country, perhaps as much out of resentment for the assumption of the *common* manufacturers and business men as sympathy for the workers, took up the cry in parliament, which finally resulted in the first enactment to limit the labor of women and children in the mills of England to twelve hours per day. From that day the workers began to carry on the movement to reduce the hours of all labor in all employments, public or private. Of course it must be borne in mind that the movement is not simply to reduce the daily working hours to eight. It is for eight hours to-day and less if needs be for the future. The same objections, the same antagonism, the same ignorance, the same arguments, and the same specious pleas had to be met and overcome in the earlier movements to reduce the hours of labor to twelve, to eleven, to ten, to nine that we are now called upon to meet. The causes that have led to the agitation of the eight hour workday are the same

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(1) *In Massachusetts in 1894, I was present at a hearing before the committee on industries and labor of the legislature, on a bill to reduce the hours of labor of children from 60 to 58 per week. The council for the Mill Owners' Association (Arkwright Club), declared that "when you take children out of the mills you take the heart out of the industry."

(2) The law upon the statute books of Alabama, prohibiting the employment of children for more than ten hours a day, was repealed by the legislature of that state at its session in 1894-5. This was done with the avowed purpose of inviting capital to invest in cotton mills. The restrictions upon the exploitation of the labor and life of the children was removed. Wretchedness, misery, squalor, poverty and hunger were the laborers' share in the great advances made in the field of industry. Premature decay, bent and dwarfed forms, pinched cheeks, sunken eyes, and early death were the workers' reward for their labor. The welfare of the nation, the prosperity of the race was threatened.

now as when the question of limiting the working hours was first broached.

Machinery is being introduced "faster than new industries are founded." What is the result? Myriads of men and women walking the streets of our cities, traversing the highways and byways of our country, vainly seeking an opportunity to earn their living by the sweat of their brows. The unemployed workers are a constant menace to the higher wages and other conditions which labor has secured. The burdens imposed upon the employed workers, the velocity with which they are required to toil (faster than that of any other people of the whole world), is enervating to the last degree. The determination that a reaction shall not set in, that the race shall not become slaves, serfs, or perish from the face of the earth; the recognition that there is no influence so potent to improve the character of the workers, instill manhood and independence in their breasts, enlarge their opportunities, widen their scope, make them larger consumers of their product, enhance their value, broaden their minds, enlarge their sympathies, make them nearer the equals of their fellows, cultivate their better tastes, their better natures; in a word, to make them better men, and in becoming better men to be better able to participate and enjoy the blessing of a bountiful nature and an enlightened age, and progress, perpetuating freedom and civilization. These may reasonably be assigned as the causes which have led to the agitation for a reduction of the hours of labor—an eight hour workday.

The workers demand leisure. With Spencer, they who have borne the awful strains and burdens of wearisome and exacting toil, not only preach, but seek to enforce the "Gospel of Relaxation"—less hours of labor—leisure. "Leisure to live, leisure to love, leisure to taste our freedom."

Who can look on the vast army of unemployed, workless workers, without feeling and recognizing that a great wrong is being perpetrated upon them. Certainly there may be some now who would not work were it offered them, but the observer will note that these are rare exceptions, and even they have become careless or reckless by easy stages on the downward grade. Demoralization caused by periodical, and then permanent enforced idleness by reason of inability to secure employment. Beyond doubt, the saddest sight is to see a man, with wife and children looking to him as the bread winner, without work, without food, without hope. That unemployed men are demoralized men is soon learned by those who frequently have an opportunity to come in contact with them, that their courage soon gives way to despair, losing self respect, early forfeiting the respect of others; go down and further down until society in its might, has its hand raised against them. Society regards them as its enemy, the feeling becomes mutual.

The only factor which earnestly, sympathetically and practically recognizes the awful conditions of the unemployed is the organized labor movement in its effort to reduce the hours of all, and thus secure an opportunity for the employment of all.

WHAT EFFECT WOULD THE INTRODUCTION OF THE EIGHT-HOUR WORKDAY HAVE UPON THE INTERESTS OF LABOR?

After all the arguments are adduced pro and con upon the question to reduce the hours of labor, the most important consideration must resolve itself upon what influence this change will have upon the interests of labor. For, differ though we may upon all else, we agree that what will really advance the material, hence the moral and social well-being of labor must beneficially reflect and act upon the whole world of civilization. We cannot successfully improve the foundation of a structure without correspondingly, permanently perfecting the structure itself. The simile holds good when applied to the structure of society the foundation and support of which is the great body of labor, the producers of wealth. Let us see then what effect the reductions of the hours of labor has had upon the interests of labor, and judging the past by the present, it is safe to venture the prediction that the same causes will produce the same results in the future.

In every industry where the hours of labor have been reduced, through the efforts of organized labor, it has been followed with these results:

Wages have been increased; periods or seasons of employment have been lengthened; the number of unemployed has been reduced; the consuming power of the laborer has increased; the leisure resulting from the lesser hours of manual labor has opened up a vista of opportunities which have made the laborer not only a worker but more of a man, with all that that ennobling term implies.

It has made him more temperate in all things and given him a clearer conception of his rights and duties as a worker, a father, a citizen and a man. It has made him more independent, more enlightened, broader in his views and in his sympathies. He has become a better safeguard to his country's honor and its interests, a stauncher defender of his home and fireside. He struggles more intensely and more wisely against every form of wrong and injustice and to attain the highest conception of human rights. Are these claims merely the result of fancy or too great an optimism, or are they the consequences of the movement to reduce the hours of labor?

Do wages increase when hours of labor are shortened? I venture the assertion that in no industry in the whole world has there been the slightest deviation from this claim. We may view any industry we please, wherever it may be located, and the results will be found to be the same. Not only this, but it is easily discernible, and may be taken as a general rule, that wherever and in whichever industry the daily hours of labor are the longest, wages are lowest; and wherever and in whichever industry the daily hours of labor are least, wages are highest.

Compare any two or more countries on the face of the globe; compare any two states in the United States; compare any two cities in any one or more states; compare any two industries in any one city; yes, compare any two establishments of a similar industry in any one city and there is no departure from this rule that the longer the hours of daily labor the lower the wages, and vice versa.

We will go even further in illustration of this invariable rule and cite a fact which everyone can easily ascertain and observe for himself.

Take any one establishment where a large number of workers are employed, and it will soon be learned that those workers whose hours of labor in that establishment are the longest, receive the lowest wages paid to any employés therein; while those who enter the works daily the latest in the morning, and depart earliest in the evening, are in receipt of the highest wages.

In the study of this apparent economic paradox, we shall see, too, that this rule of which we have spoken does not even vary when the skilled and unskilled workers are compared. That is, all other things being equal.

When skilled workers in any one industry work longer hours daily than do the unskilled workers in another industry, or calling, the same rule will apply. An instance will demonstrate this.

Machinists usually work ten hours a day; wages about $2.00 to $2.50 per day. Factory wood workers work from ten to twelve hours a day; wages from $1.25 to $1.75 per day. Hod carriers work usually nine, and in some instances, eight hours a day; wages range from $2.25 to $2.75 per day. Were the machinists, wood workers and others to devote part of their skill to the plain as well as the scientific consideration of their interests, and secure a reduction in their hours of labor to eight per day, is there any doubt that it would be followed by increased wages?

Suppose the workers would argue somewhat as follows: "The greatest article of value known to man is time. Heretofore we sold you ten hours of our time each day, for which you paid us $2.00, when we demurred to this low price you answered that there was a great glut of that article—time (labor), in the market; now since time (labor) is the only article that we possess and have to sell and must sell, and since there is such a glut of it in the market, we propose to economize and to offer you only eight hours daily of our time (labor), reserving the means (vitality, strength) to sell you the same quantity of time (labor) to-day, to-morrow and the days yet remaining to us. This will relieve the glut in the market, and, according to the law of "Supply and demand," the immutability of which you have so often and so unctiously spoken, the price of the article we have to sell, time (labor), will rise."

Perhaps many of the workers do not argue in this fashion, but their movement to reduce the hours of labor is in line with its reasoning. Where is there the business man, the thinking business man who is in business for other reasons than "his health," who will say the laborers nay? Is business conducted on other, or more equitable principles? At least the laborers have on their side all that is just and humane in their claim. They see the genius of ages centered in the wealth producing and wealth distributing methods; they see the unemployed going a hungered and those depending upon them wither like tender buds before a late blast and frost of spring; they see themselves that they soon may be compelled to change places with those whom society regards as the submerged—the unemployed; their children suffer and wane and die; they know that they themselves are unnecessarily required to work burdensome, wearisome and enervatingly long hours; that they and theirs are consequently deprived of the opportunities, which leisure alone affords, to lead a better, a higher, a nobler life.

But entirely apart from the reasoning along the lines presented by the above monologue, it can be demonstrated that a reduction in the hours of labor is of the greatest interest and advantage to the wage earners as well as the whole people.

There must be some other cause or incentive which really forces the workers to demand higher wages for less hours of labor than the mere fact that a better opportunity for demanding it has come or will come.

The fact is, that the workers who have secured a reduction in their working hours can no longer afford to work at such a low rate of wages as was paid them under the old regime of long hours. They have time and leisure on their hands with which they must do something, and do what they may. New tastes are acquired, new desires have been created, with them new expenses have been incurred. It may be that the increased leisure has brought forth a desire, a taste, a demand for a book, a paper, a magazine, either of which creates a further demand for an additional room in the worker's home. An additional room requires additional furnishings, a carpet upon the floor, a picture upon the wall, a musical instrument. Leisure forces the worker's attention to the clothing of the wife and the children. Time compels the worker to be in the streets at the time when people are best dressed, he and his must be clad as near an approach to the average or be regarded as a social inferior.

Leisure instills the desire to travel, to see other parts. Leisure cultivates tastes for art, music, the concert, operas, the theater. But the new opportunities devoted to or directed in any channel are no longer luxuries. The luxuries of the past have become the necessities of to-day, and all mankind agrees that in order that the workers may be counted upon to continue their labor, their necessities of life must be assured them. It follows, therefore, that to make the luxuries of to-day the necessities of life for the morrow—to continually raise the standard of life of the workers—is in the highest degree sound economy; moral, social, and material progress in the interests of the workers is progress in the interests of all.

Of course it would be idle to attempt to ignore the charge which is often hurled against the workers' movements to reduce the hours of labor, that the increased leisure would be spent in the saloons, in drink. To this charge we can point to the fact that there is even to-day a lesser production and consumption per capita of the liquors the poor usually drink than ever before since statistics have been ascertained, while on the other hand the liquors which the means of the rich can only afford to supply have increased largely per capita and in the aggregate. There is, however, other and better evidence to disprove the charge that the increased leisure of the workers results in drunkenness and debauchery. Workmen as soon as they organize seek meeting rooms in the buildings in which liquor is not sold. The rendezvous of labor, when unorganized, is usually the saloon, when organized, it is transferred to the meeting room, the club room, or library. Before the era of Trade Union activity, the saloons were the employment agencies. The Trade Unions in every large center now conduct free labor bureaus, free from saloon influences. Many, particularly unskilled workmen, have had to bear the sacrifices of prolonged strikes to force a change in the places on "pay day," to receive their wages from the saloon to the "job." Countless instances are in evidence that in the old era men had to loiter in and around the saloons to obtain employment, and the "best fellows," who would spend the most time and money to get into the good graces of the saloon keepers were the ones who obtained employment soonest.

One need but observe the workers whose hours of labor are comparatively low as compared with others whose hours of labor are longer and the contrast is at once noticeable and striking. The short hour worker's complexion is clearer, his eyes are brighter, his carriage and head more erect. These indications are necessarily and invariably absent from the long hour and hard drinking workman. Then again look through the police statistics and notice the comparative scantiness of the number of arrests for drunkenness and disorderly conduct of cases coming from the workmen of those trades where the short hour day prevails.

Those who have carefully observed the changes which have come to the workingman from a reduction in the daily working hours have marked most gratifyingly the fact that they have become most temperate in the liquor as well as in all other habits.* Well has it been said that the men who have the spirit ground and crushed out of them by their too long hours of toil seek to regain that spirit in the cups at night and at every other conceivable opportunity.

Among thinking men there is no dispute that there is but one way to permanently improve the conditions of the people, that is by improving their habits and customs. We submit to the candid mind that there is no possible way to improve the habits and customs of men whose hours of labor are so long that their opportunities of life are circumscribed by eating so that they may work, sleeping so they may work, scarcely dreaming or hoping for anything but work. They live to work instead of working to live. What reform, social, moral, political or ecnomic was ever achieved by the effort of the long hour workman? Which of them ever secured the eradication of a great wrong, stood for, or were identified with a struggle for a great principle? If the progress of the world depended upon the long hour workers, our civilization

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*(1) The manager of the extensive Paper Mills of Prince Paskievitch, of Dobrusch, says that he has been the manager for twenty years, and adds: "The nature of the business requires that the work be carried on day and night. Up to May, 1894, the length of the shifts was 12 hours. Eighteen months ago, I determined to try and reduce the hours of those working by the day to 9, and of those employed on shifts to 8. Instead of increased drinking by the workmen, the result has been that the only drink-shop in the place has had to give up business, its place being taken by a tea-shop, where only moderate quantities of spirits can be obtained. "St. Monday" (Blue Monday, S. G.) is almost a thing of the past. The older people, as a rule, employ their leisure time in tilling their plot of land * * * The younger ones have taken to reading. An orchestral and vocal union has been established, of which 36 factory operatives are members. Between 400 and 500 operatives regularly attend lectures. * * * Such things were impossible under the old 12 hours system: for *there is only one recreation for exhausted workers, and that is, spirit-drinking, which quickly stimulates their energies.*"

(2) "It is a flippant libel upon the laboring class which for more than half a century has been constantly repeated but never sustained, viz.: that the reduction of the hours of labor tend to lower wages, raise prices, increase idleness, dissipation and drunkenness. * * * The elimination of poverty, ignorance, pauperism, intemperance, crime and their accompanying evils, move parallel with and proportionate to the increase of the social opportunities of the laboring class." Prof. George Gunton's *Economic and Social Importance of the Eight Hour Movement, page 20.*

would halt, reaction would set in, slavery or serfdom would be the lot of the workers, barbarism and savagery would be the order of the day. Yes, thrice yes, the movement to reduce the daily hours of labor to eight, its agitation, inception and enforcement is in the interest of the workers of our country and of the whole world.

WHAT EFFECT WOULD THE INTRODUCTION OF THE EIGHT HOUR WORKDAY HAVE UPON THE INTERESTS OF CAPITAL.

To fairly and exactly state the real effect that the introduction of the eight hour workday would have upon capital is beyond doubt the most difficult of the series of questions submitted for this article. The answer will no doubt bring about me a storm from the one or the other, and perhaps both interests usually known as "Labor and Capital," but which, more properly speaking, should be known as laborers and capitalists. Between capital and labor there is and can be no dispute; between laborers and capitalists there is often and perhaps a never ending conflict so long as the parties shall hold these respective attitudes in society. The question then, of the influence of the movement to reduce the hours of labor, requires some separate consideration as to its influence upon capital and upon capitalists.

Capital may be properly defined as the residue of production over and above raw material, wages, wear and tear of machinery, rent, management, etc., this residue being again used in the production of wealth. To define the capitalist we may merely say that he is the possessor of this residue—stored up labor—which he employs for further production, residue and profit.

The conflict between the laborers and the capitalists is, as to the quantity, the amount, the wages the laborer shall receive for his part in production and the residue or profit which shall go to the capitalist. The one is the seller of an article—time—labor; the other is the buyer of this same article. Between the sellers and buyers of any one thing there never yet has been a community of interests. This conflict for the largest sare of the production has gone on from time immemorial, and cannot cease until the laborers shall be the capitalists, i. e., the capitalists shall be the laborers. In other words they shall be one and the same persons.

In the development of industry there is a constant increasing necessity for a larger share of production to be stored in order that future production may be successfully carried on, on a still greater scale. Yet to retain this increasing share or residue, and to accord labor its constantly increasing share is a problem which the future alone can solve. Whether it be by the abolition of all patent rights, monopoly in land, monopoly in money and monopoly of opportunity, or by the common ownership of the means of production and distribution, the present can at best be only conjectured.

But during the development and progress, there can be no question that, notwithstanding the awful influence and injury modern industrial conditions have upon the unemployed, wages to labor generally tend upward, the share per capita and per dollar to the workers becomes larger. On the other hand the larger scale upon which production is necessarily carried on makes it essential that great aggregations of capital be employed. It is, therefore, that we see the inability of the small manufacturer or business man to succeed, or compete, (unless in very exceptional cases and due to an incident or accident which cannot be considered with the general proposition) with the larger or bonanza concerns already in the fields of industry and commerce.

It is because of this that there is a constant change of the individual manufacturers into partnerships, companies, corporations and trusts. The residue or profit of the individual manufacturer is insufficient to successfully carry on the business. It is this diminution of the profit of the capitalist per dollar, requiring the great aggregation of capital to successfully prosecute industry. It is because of this economic development and growth of the partnerships, companies, corporations and trusts that the legislative enactments seeking their curtailment or destruction have proven impotent. There is but one power that is at all competent, and will in time unquestionably be able to cope with combinations and trusts and bring them within the reasonable scope of their legitimate function in the interest of the whole people, and that power is the much despised organized labor movement.

That the movement of labor to reduce the hours of labor has much to do with the acceleration, with the development of industry that is taking place, no keen observer will dispute. Necessity is said to be the mother of invention. Each successful effort to reduce the hours of labor makes the laborers larger consumers of their product. It brings into the ranks of the employed thousands previously unemployed, makes of them consumers as well as producers; while before they were non-producers and scant consumers. Each such stage and step brings forth the necessity for still further improvement in the means of production—improved machinery. This process is either quickened or lessened in each and every industry in the same ratio as the movements of the workers to reduce the hours of labor is successful or otherwise.

We see that in every industry where the hours of labor are the longest that there the least improvement in machinery and in productive methods take place; that there the least output of the individual and collective workers is the rule, and where the hours of labor are least, that the best machinery, the greatest individual and collective output is the case. Certainly there must be a cause for this fact. Need we look further for it when we know that this rule is invariable?

Employers of labor, in the modern sense, can only have existence where,

1st. The hours of labor of the workers are least when compared with the workers of any other country.

2d. Where the wages to labor are the highest when compared with the workers of other countries.

3d. Where industry is carried on upon a large scale.

What opportunities are there for employers of labor, or what other excuse is there even for the existence of an employing class among the Eskimos, among the American Indians or among other uncivilized people? The most extensive and successful employers of labor are only possible where the workers are best paid, work the least number of hours, are best conditioned, have the best surroundings and are, therefore, the largest consumers of their productions.

That these conclusions are based upon truth may be easily learned by following this list of nations in which hours of labor are longest, wages lowest, the workers the least consumers, and employers less extensive and successful, as the reverse of these conditions prevail, each growing in material prosperity in the order named. China, Japan, India, Italy, Hungary, Spain, Austria, Russia, Germany, France, England, the United States, the workers of the last two nations being the largest consumers of the wealth in the world and both nations marching at the head of civilization.

Nations oft in the effort to extend a market for their industries, and an opening for their commerce, are engaged in wars involving the lives of countless thousands of human beings and the destruction of millions of dollars of the product of their people, when the "home market," the increase in the consumptive power of their people, is lost sight of, when to create one additional want among the workers of a nation will give industry and commerce an impetus it can receive from no other source. Why not then devote our thought and policy to such peaceful means of relief and improvement? It has been said: "Peace hath her victories no less renowned than war." Then peace, which is as essential to successful industry as is air to lung-breathing animals, resulting from the general advantages and blessings of a shorter workday—the gospel of relaxation will bring us our renown. It should, yea must be the mainspring of our progress and success.

But in the realm of every day life of the employers they are not apt to take a broad, comprehensive, enlightened view of this question. They are more apt to look upon the subject from its immediate rather than its future effect; hence, it is necessary to treat it from that standpoint.

No one will deny that we not only have competition among workers and workers, but also among employers and employers; and so long, at least, as our present industrial and social system shall obtain it is doubtful that this will cease or lessen in acuteness. Is there, however, an employer who is at all inclined to be fair to his employés who has not felt the awful and degenerating influence which some of his unscrupulous—commonly known as "cut throat"—competitors have wrought in the business by contemptible methods of hiring the lowest priced labor and demanding the longest hours of labor?

In most things, except cost of labor, employers are fairly on an equality. They can buy their material in the same market and at the same prices. Machinery, rent, etc., are just about the same to all. The difference in prices is in the cost of labor. When contemplating, or "figuring" for a contract or in bidding for the world's market, should there not be some basis, some minimum wage and maximum hours of labor upon which the calculation should be made? Should there not be some line, at least a "living wage" upon which employers could go forth upon an equality in the field of trade? Surely ever instinct of justice, not only to the toiler and those depending upon him, not only for the preservation of our race, but also our civilization which hangs in the balance; surely every sense of fair dealing, every regard for progress, success in industry and commerce demands that in labor, above all things, the meanest of employers shall have no unfair advantage over those whose inclinations are in an opposite direction, and who, too, often are forced into the same offensive, reactionary and destructive position. Could industry by any possibility be conducted on the methods of the meanest, unchecked by labor, there is no telling how low down in the industrial world the workers of our country would sink, and how far our civilization would be dragged down with it.

But thanks to the organized labor movement of our country and our time which stands as the check upon this downward tendency, this downward grade which leads to degradation and despair; the labor movement, whose advocates, once spurned and imprisoned, but now consulted, whose professions of justice and humanity once ridiculed and condemned, now argued with and listened to, whose claim for a higher and more intelligent method of industry and commerce denounced as demagoguery and sophistry, now often heeded and followed, the organized labor movement. The early protest of the "lowly," the later defender of the toilers, the present outpost of justice, the harbinger of a better day to come among men, the labor movement compels the attention of the foolish as well as the wise, and insists that this world of ours shall be a better world, and the men and women thereof shall continue in their march undaunted and brave, ready and better prepared to meet the day when man's injustice to man shall be relegated to a dismal past.

The foremost demands of the organized labor movement is for a shorter workday. It is in the interest of labor; it must necessarily be in the interest of progress; hence, capital. It is the harbinger of more successful industry and commerce, its tendency is upward and will surely help to solve the greatest of all problems of our lives on a peaceful, potential and permanent plane.

HOW WOULD THE EIGHT HOUR WORKDAY READJUST ITSELF; THAT IS, HOW WOULD BUSINESS READJUST ITSELF TO THE CHANGE IN THE HOURS OF LABOR.

To answer this question one might nonchalantly point to the past and say that inasmuch as in the early days of our present methods of production by machinery, new tools and new inventions, the reductions of the hours of labor has gone on from early morn to late at night, and when reduced to twelve hours a day, from twelve to eleven, from eleven to ten, from ten to nine hours a day, and that business has easily adjusted itself to the altered conditions resulting therefrom; that inasmuch as none but beneficial results have followed in the wake of the movement to reduce the daily hours of labor, so will business easily adjust itself to our present demand for an eight hour workday.

But it is apprehended that this will not be all satisfying and will require a further answer; hence, before this matter is further presented, it will be necessary to refer to past movements and note their results.

For more than a century the hours of labor of the workers have continually tended lower. Each step in that direction has been either the precursor or has been followed by the introduction of new machinery, new inventions, new tools of labor, new, easier, cheaper and better methods of production. The pace with which the hours of labor have been reduced is a safe measure of determining the rapidity with which the other above named results have been followed.

In the early days of the century, custom, tradition kept the employers of labor in old ruts, the day of rapid development had not yet set in, the mind of man had not yet adapted itself to expect and to inaugurate phenominal changes that would more resemble a human economic kaleidoscope than a mere alteration from hand or primitive machine labor to the highest and most concentrated agencies of production'and distribution. It was, therefore, that in the absence of the general introduction of the latest forces of wealth producing methods that the necessity for the movement for a shorter workday had not made itself so manifest, and was not so frequently inaugurated. But as time went on and the old gave way to the new, the movement gained momentum, and we therefore see that the greatest efforts of labor and of labor organizations are concentrated upon this all prevailing, all absorbing question.

No one for a moment imagines that the eight hour workday will be generally enforced upon a given moment, although that business could, and would easily adjust itself to the radical and simultaneous change there should be no doubt.

Before 1884 the Cigarmakers' Union members and non-unionists in the United States worked as many hours as their inclinations or forced circumstances compelled; in 1884 they were set at a maximum of ten hours per day; in 1886 within four months after the resolution to that effect was approved by the journeymen, the eight-hour day was the universal rule, and has been so to this day, to the advantage of all concerned.

As the result of our general movement of May 1, 1886, more than 250,000 workers secured the eight hour day, and a million of others gained a shorter workday,* yet business easily adjusted itself to the new conditions; in fact, a period of general business prosperity ensued.

In 1889 a movement was started looking to the enforcement of the eight hour workday, May 1, 1890, among the carpenters of the country, the net result of which was among carpenters, among whom ten hours was the rule and nine the exception. After the date named 46,197 had secured the eight hour workday and nearly the entire remainder of that craft gained the nine hour day, and since then the eight hour day is the general rule in all of the building trades of large cities, and nine hours elsewhere. Does any master builder decry the new rule now? Does that vast interest now claim that business has not adjusted itself to the shorter workday? Certain it is that the Master Builders' Association is on record testifying to the mutual benefit of the measure and urging its general adoption.

In the government works of the United States the eight hour day is the rule. The English, German and Russian governments have recently made experiments in reducing the hours of labor to eight per day in some departments and retaining the old ten hour system in other departments of the same line of work. With one accord the officials all testify to the advantage and benefit of the change and propose at no distant day to generally introduce it. Employers of labor in the United States or of any other country who have the eight hour system of labor all bear testimony to the general good resulting from the change. If the results were different, if business did not easily and readily adjust itself to the change to an eight hour workday, is it not strange that there is no body of employers (and the writer does not know of a single case) which has ever given the system a fair trial, say of one year, which would ever return to the old regime of a nine hour or a longer workday?

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* As a result of the movement of May 1, 1896, street and steam railway employers, bakers, tailors, garment workers and other workers (generally unskilled), too numerous to mention, who before worked 14, 16, and in many instances 18 hours a day, had their hours generally reduced to 12.

No one appreciates more than I the fact that there is no "sentiment" in business, and that therefore, for the purpose of this article at least, it must be argued from the standpoint of business and its effect on business. Yet it may be reasonably asked whether any person who has not bidden adieu to his senses really believes that the world would stand idly by and witness the sad havoc played with myriads of human beings by modern industry conducted on "business principles," simply in the interest of a comparative few and to the detriment of the great mass of mankind.

Every one who thinks at all rationally admits that at some time, early or in the remote future a change, yes, a radical change, must and will take place in the economy of life. The only questions of difference are as to when and how the change will be brought about. With the first question of time we have at present no concern, but with the second it is our bounden duty to reckon. Reform saved England, revolution saved France from reaction and slavery. I am sure that none can accuse me of being a pessimist, a "calamity howler" or an alarmist, yet I am thoroughly convinced that modern society is presented with the same alternative.

The organized labor movement presents a reasonable and gradual method for the peaceful solution of this great problem, this great question which will not down until it is finally settled by the full installation of man into his natural right, his full estate; or by his retrogression, involving the degradation of man, the destruction of civilization. I am not pessimist enough to believe that the latter will be the outcome. I have too much faith in the sterling character, the integrity, the manhood, the independence instilled into the masses by the achievements of the labor movement to for even a moment doubt that the future will be a brighter, a happier and a nobler one than has yet dawned upon the earth.

Business is timid. It seldom ventures except upon trodden paths. Labor's proposition for a shorter workday is now met by the same opposition against which previous movements in the same direction had to contend. It can only be proven that an eight hour work day means greater and a more general prosperity when it is introduced. There are few who can be induced to make the experiment except by the power exerted by the organization of the workers.

The propositions of labor do not introduce arbitrary or new principles into society, yet they are opposed by the capitalists, economists (false economists would be more appropriate) and statesmen. The first insist that the business can not pay the increased cost of labor, the second asserts that prices of the finished product will be increased, and the third hides himself behind the plea that it is against the interests of society. That all history proves their premises false and their reasoning pure sophistry counts as nothing with them. Demonstrate that our life and progress in industry and commerce is the living proof of the truth of labor's claim, that their thesis is baseless; and they go on in the same lines with perhaps greater tenacity as if they would declare: "So much the worse for the facts of history."

It may be true that business might suffer and prices of the finished product rise, if an increase in wages would bring about no change in the mode of life or standard of living of the workers. That is, where an increase in wages would all be hoarded. But a permanent increase in wages is only possible by the advanced and improved standard of life of the workers which necessarily makes them larger consumers; hence, a larger market; hence, greater and more improved methods and reduced cost of production, and consequently lower prices.

As to the influence of a shorter workday upon society, we need to view the vast number of idle men and women of our country, the misery, squalor and degradation into which countless thousands of them have sunk and are sinking, and ask ourselves if it is not high time that so far as law can effect the labor of the "Nation's wards"—the women had children—the hours of labor should be limited and regulated; and that so far as governmental power and influence can be exerted, it should be upon the side of those who are the bone and sinew, the foundation and the mainspring of a country's greatness, prosperity and progress. Certainly, if long hours and low wages were the cause of progress, of the industrial and commercial success of a nation, China would stand at the head of civilization. As the standard of life of the workers rise, vice and crime diminish, and the inverse of this proposition is also beyond dispute. Hence, wise statesmanship should dictate a course which will tend to a higher life, only possible by a higher standard of life secured by a reduction in the hours of labor.

Legislation and the movement of labor for reduced hours of labor have yielded better results socially, economically, morally and politically than any other species of legislation and action known to human experience. The couplet is as appropriate to-day as when first written:

"Ill fares the land; to hastening ills a prey,
Where wealth accumulates and men decay."

The movement to reduce the workday to eight hours will undoubtedly be inaugurated. It is a universal demand, some people, some industries are nearer its achievement than others, but come it must, and when it does, business will readily and easily adjust itself to it, for it is the movement of the many, by the many, in the interest of all.

HOW CAN THE EIGHT HOUR DAY BE INTRODUCED WITH THE LEAST FRICTION TO EXISTING CONDITIONS?

As a matter of fact, if a wise public spirit, a comprehensive and intelligent view be taken by the employing class generally, there need be no friction whatever with the introduction of the eight hour workday. The friction, if any, which occurs, and which may occur, is because the wealth possessors refuse to harken to the new spirit of the times born of the new changes which are every moment taking place in industrial life.

The wage workers are not content, and will not content themselves with the roseate promises of the so-called, but illusionary, general benefit which may come from pursuing the policy of *laissez faire*. That principle of economy, (lack of principle would be a better term), which produced the famines in India, in Ireland, and was in vogue in the middle ages in many countries and in numberless instances since; which brought poverty, misery and degradation, costing millions of lives, brutalizing man and from which conditions heroic and desperate and bloody revolutions alone saved them. That principle of economy which is calculated to lull the workers into a fancied security will not be endured.

The workers fully recognize that to be heeded they must be heard; that if they hope to have their grievances considered, their claims adjusted, their just demands acceded to, they must organize, agitate and educate; and by the earnestness and persistency with which they press their cause will tangible and practical results follow.

There exists a denser ignorance among the wealthy classes in society as to the real tendencies of the labor movement and the sound economics contained in the demand for a shorter workday than among all others. They seldom deem it necessary to listen to the laborers' plea for justice and fair dealing, the laborers' claim upon society for a greater consideration of their rights; in a word, they imagine it unnecessary to learn the laborers' side of the labor question. So long as this practice obtains there will undoubtedly be more or less friction with every move the workers may make to secure any reform, great or small.

In 1856 the Australian workmen inaugurated a movement for an eight hour day. At first there was some little friction, every interest soon adjusted itself to it, and since then the eight hour day obtains generally.

The building, printing, cigar and numerous other trades in the United States enforced the eight hour day with little and in many instances no friction at all. It is a fact capable of easy demonstration that there is always greater friction in the efforts to reduce the hours of labor of workers who theretofore worked ten or more hours a day, to the ten or the nine hour day than is experienced by nine hour workers to secure the eight hour day. This greater friction is due to two causes; one is that the workers in those industries have been poorest organized, have shown less resistance to injustice and less determination to acquire a larger consideration of their rights; the other is, that their employers have become accustomed to look upon the simplest request of their workers as an impudent assumption to "dictate" terms.

As a consequence, friction and conflict; in that conflict industry is often paralyzed, society is impotent and looks on aghast.

We want no friction, our aim is to avoid conflict. Toilers recognize, however, that there are worse evils than strife for the achievement of a great necessary reform and that is, when a million of their number who may go on increasing, and may soon reach a point when any of them may be rendered homeless, penniless, and friendless; when they and their loved ones see nothing but a dismal future before them and for those who may follow; these evils it is urged are greater than a conflict for their obliteration and supplanting them by cheerful firesides, a nobler manhood, a more beautiful womanhood and a happier childhood.

Of course it would be most agreeable to introduce the eight hour workday without any friction at all. Certainly, every sincere man, having a due regard for the general welfare should endeavor to the best of his ability to suggest such propositions which in his judgment would cause the least possible friction or conflict in connection with the efforts made for its general introduction. With that object in view the following is submitted.

1st. The general organization of the workers in the unions of their respective trades and callings. The encouragement rather than the antagonism of employers to that end.

2d. The organization of the employers in the association of their respective industries.

3d. The mutual recognition of committees, business agents or walking delegates, for the adjustment of disputed questions of interest.

4th. The meeting of the committee of the organized workers of the country with the committee of the organized employés, one from each industry for the purpose of deciding upon the following:

(*a*) The general and simultaneous (or as near simultaneous as possible) enforcement of the eight hour workday in all industry and commerce. Of course, a clause providing that in cases of great public danger longer hours should be permissible.

(*b*) The consideration and adjustment of all grievances and proposed reforms of a general character.

(*c*) A declaration that the avowed purposes of the joint bodies are to earnestly endeavor to aid in the gradual, general, and peaceful solution of the labor problem.

(*d*) The joint bodies (committees) to meet as frequently as may be necessary but not less than once a year.

(*e*) That upon the program of business each year one of the propositions shall be, "Is a reduction in the hours of labor necessary; if so, to what extent shall they be reduced?"

(*f*) Children under the age of 14 years shall not be employed in any industrial or commercial pursuit.

Of course I do not for a moment imagine that these suggestions will be accepted or be acceptable to the great body of employers, but there can be no real dissent from the opinion that their adoption would largely contribute to the introduction of practical and much needed reform; that they would be helpful in the solution of the labor problem with the least possible friction to existing conditions and with little or no conflict in their achievement. As a reminder it may be said that these propositions are but an extension to the nation of what already exists in many localities among the best organized workers.

But should these suggestions and others of a similar nature be ignored and the methods of conciliation be spurned, what other resource is there left for the workers? Quietly and supinely submit like their prototypes of old, throw themselves before the modern juggernaut to have their hopes, aspirations, aye, their very lives ground and crushed out of them to be coined into the Deity of the hour, the Almighty Dollar? No, positively no.

We will continue to organize the forces of labor, securing a concession here and there. We will seek to secure the shorter work day if possible without causing a ripple or a shock; and yet, as certain as the organized labor movement strives to avoid strikes and does avoid them and reduces their number to a minimum, rather than allow the workers to be robbed of their birthright—the birthright of an opportunity to live, and to live as intelligent human beings, entitled to their share of the inheritance of their sires—the past ages; rather than be denied their just share in human progress, they will strike, and strike hard, and if necessary simultaneously and long until all shall accord them the full meed of praise "well done," and after the struggle will be over society and business conditions will soon and easily adjust themselves to the new order of things.

The barometer of life indicates a state of unrest and discontent incomparable with any time in the history of man. These indications justify the predictions that the workers will demand their just rights and achieve them, and first and foremost among these demands, justified by experience, as an economic, social, moral and political necessity; is the universal enforcement of the eight hour work day.

Speed the day of its coming, for it means a new era of progress among men, sung by poets, dreamed of by philosophers, struggled and hoped for, and will be conquered and inaugurated by labor; for *labor, omnia vincit.*

SAMUEL GOMPERS,
President American Federation of Labor.

There may be other reasons advanced for adopting an eight hour work day, but strictly speaking it is almost entirely a business proposition. Recognizing all this, it seems desirable that the objections to its adoption should be shown. Accordingly, Hon. George H. Barbour, vice president and general manager of the Michigan Stove Company, Detroit, was invited to prepare an article, giving reasons why the eight hour day was not practicable. His paper follows:

MR. BARBOUR'S PAPER.

Detroit, Mich., December 1, 1896.

HON. CHAS. H. MORSE, *Commissioner of Labor:*

MY DEAR SIR—I fully realize that writing an article touching on the number of hours to be considered as a day's work is taking up a subject of great importance, because, in my opinion, it is sure to affect both the employer and employé and, believing as I do, that a mutual interest should always exist between the employer and the employé so that there may be as little friction as possible, I conclude there is but one position for me to take in this discussion, and that is, to endeavor, to the best of my ability, to deal with both sides impartially and fairly. I am well aware that the subject of the eight hour movement has been very generally discussed and considered and has become quite a popular theory with the masses of labor; but there are two sides to this question; in other words this is a subject, by comparison, like a two-edged sword which "cuts both ways." The adoption of eight hours as a day's labor is sure to seriously affect both of the interested parties. I would feel disposed, upon personal grounds, to advocate somewhat favorably, eight hours as constituting a day's work; but here let us consider the great obstacle in the way: We will take for illustration a manufacturing institution that has a certain capacity. While I admit that by running the works to its fullest capacity, say 300 days of the year, 10 hours each day, the manufacturer is able to fill all his orders, yet he has no surplus stock left over at the close of the year's business. Now, by this condition of things, he has carefully figured costs and has arranged to pay all his employés as liberal wages as his business will admit, allowing for himself a fair compensation for the amount invested—nothing more. Now comes up the eight hour question for him to consider. What is his first conclusion? What does this mean to him? He argues, "I have only been able to supply the demand so far, working 10 hours daily; if I come down to only running my works eight hours per day, it means a 20 per cent decrease in my volume and I cannot supply my customers on any such basis as this. There is but one of two things left for me to do, either to insist on 10 hours as a day's work or to add to my works 20 per cent more capacity in certain departments and this means an outlay of capital for real estate, increased interest, buildings, machinery, more employés, and perhaps more clerical help, etc." Now, where is he going to land? It seems to me, with all this additional expense which must be figured against the business, with the liability that he could not increase his prices for the goods he manufacturers, the only thing he would have to resort to would be to reduce prices paid for labor or else go out of business. Does labor want this? I say no—do not crowd the manufacturer to this issue at your own expense.

One of the great obstacles that confronts the manufacturer at the present time, is the fixed expenses that follow the business 365 days of each year. It is like the interest account that never sleeps; constantly on the alert 24 hours of each day, and must be met whether business is good or bad, and especially when business is poor, then comes the trying time; certain expenses have to be met and he cannot depend too much on the future. The wise manufacturer, merchant or business man must, if he would succeed, arrange for his business on some business principles. If he fails to succeed in the business he is engaged in, there is but one thing that follows—*failure*—and if a manufacturer who employs a large number of men does not meet with success, who feels the loss the greatest, and is most seriously affected? *Those that he employs.*

The most prosperous times for the laborer are when capital as well as manufacturers and business men find such a condition in the business channels of this great country that they can give ready employment to the large army of laborers who are seeking employment. In my opinion the most prosperous times that this country ever experiences are when capital is well employed, which means at the same time that manufacturers are busy and success follows to all classes.

I would like personally, myself, to see labor employed less hours so that they might have more time to themselves, spend more time with their families and have an additional amount of recreation thrown in, but I do not advise the agitation of this subject at the expense of either the manufacturer or the employé and more especially if it means the reduction of wages to a vast number of employés of this country. It must be admitted by the laboring classes that in all manufacturing institutions more or less time is wasted during the hours of labor, and I trust I may be excused for referring to some of these abuses which could and should be remedied. Some men are always prompt and ready to commence work at the blow of the whistle, while others will often be, say, five to ten minutes late and they will take an additional amount of time before they get to work. Again during the morning hours they stop to take lunch and use up ten minutes time at least; after this the noon hour approaches; they are anxious to hear the whistle blow and may stop work ten minutes before noon so that they can wash, and a similar condition of things goes on in the afternoon. Now, you can readily see that if we only calculate on the time lost in their morning's work, we have fifteen or twenty minutes' time against him, and imagine if you can with a large force of employés what this means to the employer. The machinery is running all the time, and the employer has a right to expect an honest day's work, but such things as I have mentioned creep in. If these objectionable conditions could be removed, I believe I might personally favor nine hours as a day's work. I think this could be accomplished by both employer and employé giving due consideration to each other's rights, and if the employé would give nine hours honest work, I do not hestitate to say that I believe it would compensate the manufacturer for this additional one hour granted, but it certainly, in my opinion, would have to come about in this way if equal justice is to be shared between both parties interested.

If organizations expect to gain a victory they must be sure they are right in their demands. Unreasonable demands may at times prevail, but sooner or later a reaction will occur, and I do not believe that success will follow and prove lasting or beneficial unless it can be shown that there is a mutual benefit to be derived to both parties interested. In my opinion, laborers cannot afford to demand the eight hour policy if it is going to seriously affect their wages or incomes, and when you ask manufacturers to grant a twenty per cent reduction—say two hours less labor each day—it is sure to affect not only the employer but the employé.

I have endeavored to show in my arguments wherein the manufacturer would be seriously affected by a change in the working hours—say eight hours constituting a day's work in place of ten. All questions of this nature require very careful thought, so that any decision arrived at will not affect either parties interested. The argument may be presented that no time will be lost when an employer of labor conducts his business on what is known as hiring his help by the hour or paying them so much for each article turned out, but the same twenty per cent reduction of output creeps in here when he has only sufficient capacity to meet the demands of his trade on the basis of ten hours each day.

If Labor can, in any way, arrange so that eight hours will accomplish as much as is now accomplished in the regular ten hours, then the question is easily solved, but I fail to see how the manufacturer or employer of labor can arrange to pay as much for eight hours' work as he has been paying for the ten, unless his margin of profits has been large, otherwise he must divide up for the two hours lost with labor or advance the price of his product to cover this additional expense, which must follow on the eight hour basis in comparison with the ten hour basis, and if this were accomplished, I fear very much that the manufacturer who was willing to try the experiment would, sooner or later, come across a competitor who had refused to grant any concession from the ten hour basis, and such competition would not be very pleasant for the manufacturer who was working on the eight hour plan. Here you have again the 20 per cent disadvantage to overcome, and my best judgment would lead me to conclude that such competition to stand up against would prove disastrous in the end to labor. Sure it is a manufacturer cannot count the cost of his product even 5 or 10 per cent more than his competitor is offering to sell a similar article and expect to remain in business very long; so I wish to call your special attention to what seems to me to be the all-important in this subject, and that is, not to allow a decision to be arrived at without considering well the effects. If your employer is seriously affected, and by a change from ten hours to eight he finds his business is crippled so that he cannot continue it, you, the employé, will be the loser as well as the employer. Therefore, I repeat again and caution labor to not act hastily in this matter, but give it careful consideration, and do not force the issue if you cannot offer with the eight hour plan something to counteract the 20 per cent loss of time when the ten hour plan is taken into consideration as a day's work.

In certain lines of work there may be more or less pleasure, but in the majority of cases men or women do not work simply because they especially like to, but from a condition which exists or for the revenue it brings. Certain it is that one feels physically better to do a certain amount of work and nature requires it, but over-work is not a good thing to advocate. When we see young boys or girls working beyond what nature will stand, there is only one result, and that is sooner or later they will give out, and then there is but little for them to enjoy, for the one reason, if nothing more, that they have been unable to save but little, and I am a strong believer that practical laws should be made to carefully govern and protect this class of labor. We must not forget the all-important thing, and that is to educate boys and girls. Give them a good, common school education if nothing more, and then when they arrive at a certain age they will be much better prepared to go out into the world and care for themselves. If it were possible, I would advocate doing away entirely with what is termed child labor, because it deprives them of an education, which is so essential, and there are any number of arguments that could be presented against the employment of the younger classes were it not often that the main support of a family depends on this class of labor. There is something even more important to look forward to, and that is the future conditions that must follow unless we legislate to improve them. To a greater or less extent I am sure we have somewhat improved these conditions, but there is still room for much more improvement.

A word here regarding our present manufacturing institutions may not be out of place. We take for granted that more or less of the young element, say over 14 years of age, will always be employed, and it should be the aim of every manufacturer to see to it that any improvement that can be added to benefit this class of labor should be adopted, and this should not only be confined to the young class, but should equally affect all employés; in other words, make everything as pleasant and inviting as possible. In the writer's opinion the more inviting you can make the work shop the more work will be accomplished.

Sometimes I think we forget about the working man when old age creeps on; it cannot be expected that he will accomplish as much work when he is old as when young or in middle life, and a good, faithful servant is deserving of reward. Let us not forget this. It is not always possible for us to do as we would like, but we should always show a disposition to benefit our fellowman whenever we can.

There is another condition which has taken place during the past few years that has affected labor and in many ways seriously. I refer to the improvements in machinery, or, in many instances, new machinery invented which has taken the place of the individual laborer, and this will continue to be in the future, in my opinion, as many a man's mind is busily at work trying to invent something that will prove a labor-saving device, and if the invention proves a success, it is sure to be adopted. I would like to see in this great country of ours, at all times, manufacturing as well as all business industries giving steady employment and paying good wages, and under such a state of affairs we would all be prosperous. In our past history, however—and it is the same in the history of all countries—we have, at times, satisfactory conditions and then we have unsatisfactory conditions, and I imagine this will be the case in the future. I know of no remedy that can change this. I am inclined to believe that we have today about all the unskilled labor we can well care for, and so far as my experience goes, it is this class of labor that is most largely out of employment when we have reverses in business, and to this point I would especially call the attention of Labor Organizations that, if this be true, would it not be well to favor legislation restricting immigration for a time at least, so that we can better care for those who are distributed all over our country seeking employment and unable to secure it? The skilled mechanic suffers more or less, we must admit, but the great question of the day is what can we do to benefit the condition? I believe the present Emigration Bill, known as the Corliss Bill, should be carefully considered. What we should all strive to accomplish, and be willing to work for, is the elevation of all classes. If we want to improve the condition of men or women, I know of no better way than to show them that we take an interest in them, and there are many ways of accomplishing all this. I admit it means work, but if we can accomplish the result who is not willing to work? The better the man the better citizen he will be. We must all be in sympathy with the unfortunate. Picture, if you can, the situation of a laboring man with a family (be it small or large in number), out of employment with nothing saved from his earnings. He goes daily from place to place seeking work but meets with no success. Under such a state of affairs his family soon comes to want and begins to suffer for the want of food and fuel, to say nothing about the other necessities of life. Can you imagine anything more pitiful? What a condition to be placed in! No one can fully realize such a condition as this unless he has had the experience, but there are many today, I regret to say, in just this condition. Thanks to the good people, however, who are engaged in charity work, and look after just such cases, the suffering that would naturally follow is thereby relieved, but still better would be the ability to give all employment. Some of our readers may say I have drifted from the subject of this article, but I trust that I may be excused by now returning to it, and let me say here, I am not opposed to organized labor. I am a believer in organizations that have for their foundations substantial structures that will benefit the cause for which they are intended. Much good can be accomplished in well organized bodies, but reason and justice to all must be the foundation if success is expected to follow. Labor organizations have a great work to perform, and I believe a great future is in store for them if they will be reasonable and just, and when they legislate to accomplish anything, remember the saying of David Crockett, "Be sure you are right then go ahead." All the world is looking for the work of these organizations—if it be for good they will have accomplished great results—if their demands are unreasonable then failure is liable to follow. If, however, they legislate to the mutual interest of both their employers and themselves, they will surely succeed and they will be deserving of success.

In the further consideration of this eight hour subject, do not misunderstand me as being opposed to it, if it can be shown that such a condition can be brought about without affecting the employer or employé, but I want to again caution the labor organizations that if they legislate to increase the cost of production to the manufacturer by the eight hour problem to an extent that his business will not stand this change, he will be obliged to reduce the wages of those in his employ, or go out of business, which would then throw out of employment all those employed by him, and this is what I want to caution the labor organizations against. If they can accomplish the universal adoption of the eight hour system, then they have solved the question, because when all manufacturing institutions, in all lines, are on the same basis then all are on an equality and everything will work to the satisfaction of all; but do not let the conditions of the East, for example, be on the basis of eight hours and the West, in part or as a whole, be on the ten hour basis, because then there would be no equality. Competition on any such basis as this needs no argument to show what a ruinous condition we all would soon be placed in—the employer as well as the employé. If this universal adoption of the eight-hour system became a law all over our country we would then expect advances on all lines of manufactured products. I take for granted that labor would not find fault with advanced prices following the eight-hour plan in place of ten as constituting a day's work, but by such a condition how would the agricultural classes of our country be placed if they found their products way down in price, as they have been the past few years, because we must not forget that a large amount of their products has of late been seriously affected by the cheap labor of South America, Australia, Russia and India, and the question here of supply and demand is the all-important, as I have further discussed in the conclusion of this article. Let us be just, man to man, if we would succeed, and success is what we are all striving after. As a further example, to substantiate my argument, may I ask if any of us would be satisfied with twelve ounces to a pound in place of sixteen ounces, or to call twenty-four inches a yard instead of thirty six inches? I think not, and to show a willingness on my part to try to prevent unreasonable demands and the serious results that are liable to follow, is why I consented to write this article on the eight hour subject. Believe me when I say that I am as much interested as the reader can himself be to see the condition of all classes improved, and will promise to do all in my power to assist in accomplishing anything in this direction.

There is one thing more that we should not lose sight of,—that is, the two words in the English language that carry with them a power, namely, "Supply and Demand." When a manufacturer, the agricultural class, or any business institution has a good supply and a large demand follows, I will guarantee prosperous times, and all classes of labor will feel the good effects. We will then all be prosperous and happy, and this condition is what we are waiting for. I hope it will not be long before prosperity and good fortune will come to all classes, and we can once more say we are a Happy, Prosperous and Patriotic People working for the good of all.

Very respectfully,

GEORGE H. BARBOUR,

Vice Pres. and Gen. Mgr., The Michigan Stove Company.

Coming as they do from men who have given this vital question candid, thoughtful and thorough study, every intelligent student of the labor problem can but be deeply interested in these papers. Their careful perusal is commended to all with the hope that good results may follow their publication.

PART III.

MICHIGAN FOREST STATISTICS.

Michigan was famous in an early day for the extent and value of its forests. The whole State was practically a vast expanse of valuable timber. Today our pine is nearly all gone and our forests of oak, ash, maple, basswood, black walnut and other varieties are fast being removed, either by the process of clearing the land for farms or for commercial purposes. Already many of our people are seeing the necessity for preserving as far as possible our remaining forests from wanton waste and destruction. To this end the Legislature has provided by law for Arbor Day. The Governor by proclamation designates a certain day to be observed as Arbor Day, and people are urged to plant trees and shrubbery. As a result, thousands of trees are set every year.

It is an open question just what effect the removal of our forests has had on our climate. It is claimed by some that it has affected the rainfall and that the severe droughts from which the State has suffered in the last decade may be assigned to the loss of our forests. So far there seems to be but little evidence that timber has exerted any perceptible influence on the rainfall. It is probably true that with the removal of forests sun and air have been "let in" with the result that the water has "dried up" much quicker than formerly.

Neither in the State or National Census, nor in other statistical inquiry, has an effort been made to ascertain the extent of forest remaining in the State. The nearest approach to it seems to be in the statistics of improved and unimproved lands.

As a step toward showing the necessity for preserving our remaining forests, the Michigan Bureau of Labor and Industrial Statistics has endeavored, as accurately as possible, to ascertain the number of acres of timber growth remaining in the State. The inquiries were made through supervisors of townships, using the schedule as given below:

MICHIGAN BUREAU OF LABOR AND INDUSTRIAL STATISTICS, 1896.

STATISTICS OF FOREST LANDS IN MICHIGAN.

Statement of the number of acres of land covered wholly or in part with forest.

[Be careful and fill accurately and plain.]

Township of .... county of .... State of Michigan.
Number of "surveyed" townships included in your township ....

[Some organized townships in the newer portions of the State contain two or more surveyed towns.]

Number of acres of standing hardwood forest in entire township ....
Number of acres of standing pine forest ....
Number of acres of standing hemlock forest ....
Number of acres of "plains" wholly or in part covered with bushes or scattering trees
....
Number of acres of swamp or marsh wholly or in part covered with bushes or scattering trees ....
Remarks ....
....
....
....
....
....
Sign officially:

Write on back of blank if more space is needed.

It was the intention to get the blanks into supervisors' hands before the commencement of the annual assessment. A large number of supervisors filled the schedules, after making careful inquiry in their townships. Failing to receive the schedules in time, other supervisors filled the schedules by estimating the forests in their townships. In a very few cases supervisors neglected or refused to furnish the information. In these cases county surveyors or others in a position to know have furnished the information. As a whole, it is believed the reports are very nearly accurate—at least as much so as it is possible to make them without personal inquiry by persons expressly engaged for that purpose. There are 1,211 organized townships in the State. In the newer portion, notably in the Upper Peninsula, there are two or more "surveyed towns" for each organized township, with one supervisor. Reports were received from all but seven of the townships. Supervisors are entitled to much credit for the assistance they have rendered without other compensation than a copy of the report. Their reports given by counties and townships, together with a recapitulation, follow, and will be found of local interest to every section of the State, containing comprehensive and valuable information.

FOREST STATISTICS BY COUNTIES AND TOWNSHIPS.

ALCONA COUNTY

Has eleven organized townships, consisting of eighteen whole and two fractional surveyed towns; 30,387 acres of hardwood; 1,640 acres of pine; 13,620 acres of hemlock; 135,000 acres of plains partly covered with bushes and scattering trees; 34,580 acres of swamp partly covered with small timber and bushes.

ALCONA—Has two whole surveyed towns; 3,200 acres of hardwood; no pine; 1,000 acres of hemlock; 25,000 acres of plains partly covered with bushes and scattering trees; 4,000 acres of swamp partly covered with small timber and bushes.

CALEDONIA—Has two whole surveyed towns; 200 acres of hardwood; no pine; 300 acres of hemlock; 30,000 acres of plains partly covered with bushes and scattering trees; 3,500 acres of swamp partly covered with small timber and bushes. This township has 4,000 acres of lakes.

CURTIS—Has two whole surveyed towns; 1,438 acres of hardwood; no pine; no hemlock; 1,500 acres of plains partly covered with bushes and scattering trees; no swamp.

GREENBUSH—Has one fractional surveyed town; 1,000 acres of hardwood; 800 acres of pine; 2,000 acres of hemlock; 6,000 acres of plains partly covered with bushes and scattering trees; 4,000 acres of swamp partly covered with small timber and bushes. This township was once heavily timbered with pine, hemlock, cedar and hardwood.

GUSTIN—Has 4,000 acres of hardwood; no pine; 400 acres of hemlock; 4,000 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes. This township has about 2,000 acres of low lands covered with a mixed growth of tamarack, cedar, balsam, spruce and ash.

HARRISVILLE—Has one fractional surveyed town; 529 acres of hardwood; no pine; 100 acres of hemlock; 3,500 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

HAWES—Has three whole surveyed towns; 2,300 acres of hardwood; 200 acres of pine; 2,000 acres of hemlock; 23,000 acres of plains party covered with bushes and scattering trees; 15,000 acres of swamp partly covered with small timber and bushes.

HAYNES—Has 600 acres of hardwood; no pine; 200 acres of hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes. This township was once timbered with pine and hemlock.

Mikado—Has two whole surveyed towns; 8,000 acres of hardwood; no pine; 2,500 acres of hemlock; 4,000 acres of plains partly covered with bushes and scattering trees; 520 acres of swamp partly covered with small timber and bushes. A part of one town is State Agricultural College land.

Millen—Has three whole surveyed towns; 4,000 acres of hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp party covered with small timber and bushes. The hardwood includes maple, beech, basswood, elm, white and black ash and birch.

Mitchell—Has two whole surveyed towns; 5,120 acres of hardwood; 640 acres of pine; 5,120 acres of hemlock; 32,000 acres of plains partly covered with bushes and scattering trees; 2,560 acres of swamp partly covered with small timber and bushes; hardwood and hemlock are mixed about half and half, making 10,240 acres.

ALGER COUNTY.

Has seven organized townships, consisting of seventeen whole and ten fractional surveyed towns; 297,140 acres of hardwood; 22,800 acres of pine; 46,064 acres of hemlock; 66,260 acres of plains partly covered with bushes and scattering trees; 63,640 acres of swamp partly covered with small timber and bushes.

Au Train—Has two whole and small parts of five fractional surveyed towns, the north end being very irregular; 60,000 acres of hardwood; 10,000 acres of pine; 10,000 acres of hemlock; 8,000 acres of plains partly covered with bushes and scattering trees; 6,000 acres of swamp partly covered with small timber and bushes. There are 20,000 acres of pine and hemlock mixed in this township.

Burt—Has four whole surveyed towns and one small fraction of a surveyed town; 30,000 acres of hardwood; 1,000 acres of pine; no hemlock; 30,000 acres of plains partly covered with bushes and scattering trees; 12,000 acres of swamp partly covered with small timber and bushes.

Limestone—Has one whole and parts of two other surveyed towns, seventy-five sections in all; 28,000 acres of hardwood; no pine; 4,124 acres of hemlock; no plains; 15,360 acres of swamp partly covered with small timber and bushes.

Mathias—Has two whole surveyed towns; 25,000 acres of hardwood; 5,000 acres of pine; 5,000 acres of hemlock; 6,000 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp partly covered with small timber and bushes. There are 10,000 acres of hemlock and pine mixed.

Munising—Has 241 square miles; there are four whole, three half and six fractional surveyed towns; 85,640 acres of hardwood; 6,800 acres of pine; 16,440 acres of hemlock; 9,960 acres of plains partly covered with bushes and scattering trees; 13,800 acres of swamp partly covered with small timber and bushes. The estimate of timber was made by County Surveyor J. E. O'Rouark. The estimate is probably as near correct as could be obtained without an actual survey. The township is one of the largest in the State, extending over thirty-five miles in length and bordering largely on Lake Superior.

Onota—Has two whole surveyed towns, one-half of another, and a fraction on Lake Superior; 40,000 acres of hardwood, with hemlock interspersed; no pine; no hemlock; except among the hardwood; 5,000 acres of plains partly covered with bushes and scattering trees; 6,000 acres of swamp partly covered with small timber and bushes.

Rock River—Has one whole, one fractional, and part of another whole surveyed town; 28,500 acres of hardwood; no pine; 10,500 acres of hemlock; 7,300 acres of plains partly covered with bushes and scattering trees; 5,480 acres of swamp partly covered with small timber and bushes.

ALLEGAN COUNTY

Has twenty-four organized townships; 29,768 acres of hardwood; 82 acres of pine; 70 acres of hemlock; 72,030 acres of plains partly covered with bushes and scattering trees; 23,163 of swamp partly covered with small timber and bushes.

Allegan—Has 1,133 acres of hardwood; no pine; no hemlock; 1,475 acres of plains partly covered with bushes and scattering trees; 135 acres of swamp partly covered with small timber and bushes.

Casco—Has one full township and a small fraction; 1,500 acres of hardwood; no pine; no hemlock; 900 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Cheshire—Has 1,800 acres of hardwood; no pine; no hemlock; 100 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes.

Clyde—Has 300 acres of hardwood; no pine; no hemlock; 12,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes. This township formerly had much pine.

Dorr—Has 1,300 acres of hardwood; no pine; no hemlock; 500 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes.

Fillmore—Has 231 acres of hardwood; no pine; 20 acres of hemlock; 200 acres of plains partly covered with bushes and scattering trees; 150 acres of swamp partly covered with small timber and bushes. This township is nearly all cleared land.

Ganges—Has 375 acres of hardwood; no pine; no hemlock; 500 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes.

Gun Plain—Has 1,500 acres of hardwood; no pine; no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes.

Heath—Has 975 acres of hardwood; no pine; no hemlock; 11,140 acres of plains partly covered with bushes and scattering trees; no swamp; this township is mostly uninhabited plains.

Hopkins—Has 1,800 acres of hardwood; no pine; no hemlock; no plains; no swamp; the standing timber is mostly beech and maple.

Laketown—Has no hardwood; no pine; no hemlock; no plains; 80 acres of swamp partly covered with small trees and bushes; this township is less than a full township.

Lee—Has 1,365 acres of hardwood; 70 acres of pine; no hemlock; 13,150 acres of plains partly covered with bushes and scattering trees; 740 acres of swamp partly covered with small trees and bushes.

Leighton—Has 1,470 acres of hardwood; no pine; no hemlock; no plains; 414 acres of swamp partly covered with small timber and bushes.

Manlius—Has 200 acres of hardwood; no pine; no hemlock; 11,000 acres of plains partly covered with bushes and scattering trees; 4,200 acres of swamp partly covered with small timber and bushes; the hardwood is in small pieces throughout the township, and the swamp land is covered with water during the greater part of the year.

Martin—Has 3,000 acres of hardwood; 10 acres of pine; no hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 4,500 acres of swamp partly covered with small timber and bushes.

Monterey—Has 1,300 acres of hardwood; no pine; no hemlock; 1,200 acres of plains partly covered with bushes and scattering timber; no swamp; hardwood is mostly beech and maple. One farmer set out sixty acres of trees.

Otsego—Has 1,647 acres of hardwood; no pine; no hemlock; 227 acres of plains partly covered with bushes and scattering timber; the hardwood is mostly beech, maple, oak, elm and ash.

Overisel—Has 500 acres of hardwood; no pine; 50 acres of hemlock; no plains; 50 acres of swamp partly covered with small timber and bushes.

Pine Plains—Has 100 acres of hardwood; no pine; no hemlock; 16,000 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes.

Salem—Has 3,000 acres of hardwood; no pine; no hemlock; 300 acres of plains partly covered with bushes and scattering trees; no swamp.

Saugatuck—Has 400 acres of hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes.

Trowbridge—Has 1,472 acres of hardwood, nearly all beech; no pine; no hemlock; 338 acres of plains partly covered with bushes and scattering trees; 320 acres of swamp partly covered with small timber and bushes; the hardwood is nearly all beech.

Watson—Has 1,700 acres of hardwood; no pine; no hemlock; 1,000 acres of swamp partly covered with small timber and bushes.

Wayland—Has 1,800 acres of hardwood; 20 acres of pine; no hemlock; no plains; 3,056 acres of swamp partly covered with small timber and bushes.

ALPENA COUNTY

Has seven organized townships, consisting of 22 surveyed towns, part of which are fractional; 28,980 acres of hardwood; 80 acres of pine; 15,440 acres of hemlock; 119,640 acres of plains partly covered with bushes and scattering trees; 87,240 acres of swamp partly covered with small timber and bushes.

Alpena—Has six fractional surveyed towns; 2,000 acres of hardwood; no pine; 1,000 acres of hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 30,000 acres of swamp partly covered with small timber and bushes.

Green—Has two whole and one fractional surveyed towns; 2,000 acres of hardwood; no pine; 2,000 acres of hemlock; 30,000 acres of plains partly covered with bushes and scattering trees; 10,000 acres of swamp partly covered with small timber and bushes; the hardwood and hemlock are mixed; plains mostly covered with poplars, oaks and small pines.

Long Rapids—Has three surveyed towns; 5,000 acres of hardwood; no pine; no hemlock; 10,000 acres of plains partly covered with bushes and scattering trees; 15,000 acres of swamp partly covered with small timber and bushes; the greater part of the land in this township is cedar, tamarack, pine and black ash swamp.

Maple Ridge—Has one whole and one fractional surveyed town; 6,000 acres of hardwood; no pine; 2,000 acres of hemlock; 6,000 acres of plains partly covered with bushes and scattering trees; 8,000 acres of swamp partly covered with small timber and bushes.

Ossineke—Has three surveyed towns; 6,500 acres of hardwood; no pine; 5,000 acres of hemlock; 42,000 acres of plains partly covered with bushes and scattering trees; 15,000 acres of swamp partly covered with small timber and bushes.

Sanborn—Has two fractional surveyed towns; 1,480 acres of hardwood; 80 acres of pine; 1,440 acres of hemlock; 5,640 acres of plains partly covered with bushes and scattering trees; 8,240 acres of swamp partly covered with small timber and bushes.

Wilson—Has two whole and one fractional towns; 6,000 acres of hardwood; no pine; 4,000 acres of hemlock; 16,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes; this town was once a valuable pine forest.

ANTRIM COUNTY

Has fifteen organized townships, consisting of sixteen surveyed towns; 153,345 acres of hardwood; 5,800 acres of pine; 12,539 acres of hemlock; 28,058 acres of plains partly covered with bushes and scattering trees; 14,449 acres of swamp partly covered with small timber and bushes.

Banks—Has 5,000 acres of hardwood; no pine; 1,000 acres of hemlock; 10,000 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes.

Central Lake—Has less than a full township; 7,740 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Chestonia—Has 13,824 acres of hardwood; no pine; no hemlock; no plains; 3,840 acres swamp partly covered with small timber and bushes; considerable hemlock mixed with the hardwood; swamp lands covered with cedar, tamarack, spruce and balsam.

Custar—Has 13,502 acres of hardwood; no pine; no hemlock; 2,858 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes; considerable pine and hemlock mixed in with the hardwood.

Echo—Has 6,000 acres of hardwood; no pine; 2,000 acres of hemlock; 7,000 acres of plains partly covered with bushes and scattering trees; 2,739 acres of swamp partly covered with small timber and bushes.

Elk Rapids—Has one fractional surveyed town; 90 acres of hardwood; no pine; 186 acres of hemlock; no plains; 80 acres of swamp partly covered with small timber and bushes.

Forest Home—Has 6,957 acres of hardwood mixed with hemlock; no pine; no hemlock; no plains; no swamp.

Helena—Has one fractional surveyed town; 1,700 acres of hardwood; no pine; 3 acres of hemlock; no plains; 500 acres of swamp.

Jordan—Has 14,114 acres of hardwood; no pine; 4,000 acres of hemlock; no plains; no swamp.

Kearney—Has 19,332 acres of hardwood; no pine; 250 acres of hemlock; no plains; 3,440 acres of swamp partly covered with small timber and bushes.

Mancelona—Has two surveyed towns; 26,532 acres of hardwood; 5,760 acres of pine; 1,100 acres of hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes; the Antrim iron furnace converts about five acres of standing hardwood into charcoal daily.

Milton—Has one fractional surveyed town; 3,330 acres of hardwood; no pine; no hemlock; 7,200 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes.

Star—Has 18,499 acres of hardwood, mixed with pine and hemlock; no separate pine or hemlock; no plains; no swamp.

Torch Lake—Has one fractional surveyed town; 725 acres of hardwood; no pine; no hemlock; 1,000 acres of plains covered with bushes and scattering trees; 50 acres of swamp partly covered with small timber and bushes.

Warner—Has 16,000 acres of hardwood; 40 acres of pine; 4,000 acres of hemlock; no plains; 1,000 acres of swamp partly covered with small timber and bushes.

ARENAC COUNTY

Has eleven organized townships, consisting of thirteen surveyed towns; 35,745 acres of hardwood; 160 acres of pine; 2,677 acres of hemlock; 33,375 acres of plains partly covered with bushes and scattering trees; 16,790 acres of swamp partly covered with small timber and bushes.

Adams—Has 50 acres of hardwood; no pine; 160 acres of hemlock; 6,000 acres of plains partly covered with bushes and scattering trees; 6,000 acres of swamp partly covered with small timber and bushes.

Arenac—Has one whole and one fractional surveyed town; 6,192 acres of hardwood; no pine; 126 acres of hemlock; 1,920 acres of plains partly covered with bushes and scattering trees; 360 acres of swamp partly covered with small timber and bushes.

Au Gres—Has 6,400 acres of hardwood; 160 acres of pine; 80 acres of hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 2,500 acres of swamp partly covered with small timber and bushes.

Clayton—Has 1,890 acres of hardwood; no pine; no hemlock; 5,120 acres of plains partly covered with bushes and scattering trees; no swamp.

Deep River—Has no hardwood; no pine; no hemlock; no plains; no swamp.

Lincoln—Has 2,000 acres of hardwood; no pine; no hemlock; no plains; 1,500 acres of swamp; partly covered with small timber and bushes.

Mason—Has 1,234 acres of hardwood; no pine; 811 acres of hemlock; 4,675 acres of plains partly covered with bushes and scattering trees; 1,870 acres of swamp partly covered with small timber and bushes.

Moffitt—Has 680 acres of hardwood; no pine; no hemlock; 8,660 acres of plains partly covered with bushes and scattering trees; 960 acres of swamp partly covered with small timber and bushes.

Standish—Has one fractional surveyed town; 1,644 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Turner—Has 5,568 acres of hardwood; no pine; 500 acres of hemlock; no plains; 100 acres of swamp partly covered with small timber and bushes.

Whitney—Has one whole and one fractional surveyed town; 10,000 acres of hardwood; no pine; 1,000 acres of hemlock; 6,000 acres of plains partly covered with bushes and scattering trees; 4,000 acres of swamp partly covered with small timber and bushes; the hardwood consists of ash, maple, basswood, and second growth elm.

BARAGA COUNTY

Has five organized townships consisting of twenty-two whole and nine fractional surveyed towns; 218,402 acres of hardwood; 61,000 acres of pine; 117,000 acres of hemlock; 68,700 acres of plains partly covered with bushes and scattering trees; 47,818 acres of swamp partly covered with small timber and bushes.

Arvon—Has two whole and four fractional surveyed towns; 65,322 acres of hardwood; no pine; 18,000 acres of hemlock; 700 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes.

Baraga—Has four whole and two fractional surveyed towns; 32,000 acres of hardwood; 8,000 acres of pine; 50,000 acres of hemlock; 6,000 acres of plains partly covered with bushes and scattering trees; 1,818 acres of swamp partly covered with small timber and bushes.

Covington—Has three surveyed towns; 46,080 acres of hardwood; 1,000 acres of pine; 5,000 acres of hemlock; 12,000 acres of plains partly covered with bushes and scattering trees; 4,700 acres of swamp partly covered with small timber and bushes; hardwood is largely maple and birch.

L'Anse—Has eight whole and three fractional surveyed towns; 40,000 acres of hardwood; 2,000 acres of pine; 40,000 acres of hemlock; 38,000 acres of plains partly covered with bushes and scattering trees; 36,000 acres of swamp partly covered with small timber and bushes.

Spurr—Has five surveyed towns; 35,000 acres of hardwood; 50,000 acres of pine; 4,000 acres of hemlock; 12,000 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp partly covered with small timber and bushes.

BARRY COUNTY

Has sixteen organized townships; 39,691 acres of hardwood; no pine; no hemlock; 3,149 acres of plains partly covered with bushes and scattering trees; 19,579 acres of swamp partly covered with small timber and bushes.

Assyria—Has 570 acres of hardwood; no pine; no hemlock; no plains; 3,000 acres of swamp, some of which is quite heavily timbered with elm, soft maple and black ash.

Baltimore—Has 4,300 acres of hardwood; no pine; no hemlock; no plains; 4,000 acres of swamp partly covered with small timber and bushes.

Barry—Has 2,000 acres of hardwood; no pine; no hemlock; 300 acres of plains partly covered with bushes and scattering trees; 2,700 acres of swamp partly covered with small timber and bushes.

Carlton—Has 5,482 acres of hardwood; no pine; no hemlock; no plains; 550 acres of swamp partly covered with small timber and brush.

Castleton—Has 2,542 acres of hardwood; no pine; no hemlock; no plains; 2,039 acres of swamp partly covered with small timber and brush.

Hastings—Has 3,000 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Hope—Has 1,700 acres of hardwood; no pine; no hemlock; no plains; 3,400 acres of swamp partly covered with small timber and bushes.

Irving—Has 4,600 acres of hardwood; no pine; no hemlock; 500 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Johnstown—Has 1,597 acres of hardwood; no pine; no hemlock; 352 acres of plains partly covered with bushes and scattering trees; 446 acres of swamp partly covered with small timber and bushes.

Maple Grove—Has 1,918 acres of hardwood; no pine; no hemlock; no plains; 655 acres of swamp partly covered with small timber and bushes.

Orangeville—Has 425 acres of hardwood; no pine; no hemlock; no plains; 865 acres of swamp partly covered with small timber and bushes.

Prairieville—Has 2,794 acres of hardwood; no pine; no hemlock; no plains; 254 acres of swamp partly covered with small timber and bushes.

Rutland—Has 2,700 acres of hardwood; no pine; no hemlock; 100 acres of plains partly covered with bushes and scattering trees; 600 acres of swamp partly covered with small timber and bushes.

Thornapple—Has 3,460 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Woodland—Has 2,287 acres of hardwood; no pine; no hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes.

Yankee Springs—Has 316 acres of hardwood; no pine; no hemlock; 1,897 acres of plains partly covered with bushes and scattering trees; 370 acres of swamp partly covered with small timber and bushes.

BAY COUNTY

Has fourteen organized townships, consisting of ten whole and seven fractional surveyed towns; 28,278 acres of hardwood; no pine; 9,720 acres of hemlock; 42,165 acres of plains partly covered with bushes and scattering trees; 14,240 acres of swamp partly covered with small timber and bushes.

Bangor—Has one fractional surveyed town; 133 acres of hardwood; no pine; no hemlock; no plains; 800 acres of swamp partly covered with small timber and bushes.

Beaver—Has no hardwood; no pine; 4,360 acres of hemlock; 11,220 acres of plains partly covered with bushes and scattering trees; 270 acres of swamp partly covered with small timber and bushes.

Frankenlust—Has one fractional surveyed town; no hardwood; no pine; no hemlock; 1,820 acres of plains partly covered with bushes and scattering trees; 1,100 acres of swamp partly covered with small timber and bushes.

Fraser—Has one whole and one fractional surveyed town; no hardwood; no pine; 2,000 acres of hemlock; 11,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Garfield—Has 5,760 acres of hardwood; no pine; 1,280 acres of hemlock; 5,760 acres of plains partly covered with bushes and scattering trees; 2,560 acres of swamp partly covered with small timber and bushes.

Gibson—Has 500 acres of hardwood; no pine; 200 acres of hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; no swamp.

Hampton—Has 760 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Kawkawlin—Has one whole and one fractional surveyed town; 4,300 acres of hardwood; no pine; 200 acres of hemlock; 7,065 acres of plains partly covered with bushes and scattering trees; 2,500 acres of swamp partly covered with small timber and bushes.

Merritt—Has one fractional surveyed town; 3,000 acres of hardwood; no pine; no hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes.

Monitor—Has 1,800 acres of hardwood; no pine; no hemlock; no plains; 1,675 acres of swamp partly covered with small timber and bushes.

Mt. Forest—Has 1,625 acres of hardwood; no pine; no hemlock; no plains; 1,155 acres of swamp partly covered with small timber and bushes.

Pinconning—Has 8,800 acres of hardwood; no pine; 1,680 acres of hemlock; no plains; 880 acres of swamp partly covered with small timber and bushes. This town estimated by ex-Supervisor Louis A. Pelkey.

Portsmouth—Has two fractional surveyed towns; 900 acres of hardwood; no pine; no hemlock; 300 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes. Hardwood consists largely of oak, ash and elm.

Williams—Has 700 acres of hardwood; no pine; no hemlock; no plains; 600 acres of swamp partly covered with small timber and bushes.

BENZIE COUNTY

Has twelve organized townships, consisting of eight whole and five fractional surveyed towns; 61,747 acres of hardwood; 1,950 acres of pine; 3,540 acres of hemlock; 48,876 acres of plains partly covered with bushes and scattering trees; 7,915 acres of swamp partly covered with small timber and bushes.

Almira—Has 5,000 acres of hardwood; 1,000 acres of pine; 500 acres of hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; 600 acres of swamp partly covered with small timber and bushes; about 2,000 acres of the hardwood timber is very poor.

Benzonia—Has one fractional surveyed town; 3,200 acres of hardwood; no pine; no hemlock; 9,180 acres of plains partly covered with bushes and scattering trees; 1,940 acres of swamp partly covered with small timber and bushes; some hemlock interspersed among the hardwood.

Blaine—Has 1,200 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes; some hemlock interspersed among the hardwood.

Colfax—Has one surveyed town; 5,000 acres of hardwood; 200 acres of pine; 1,000 acres of hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes; hemlock interspersed with the hardwood.

Crystal Lake—Has one fractional surveyed town; 2,720 acres of hardwood; no pine; no hemlock; 700 acres of plains partly covered with bushes and scattering trees; 155 acres of swamp partly covered with small timber and bushes; some hemlock interspersed among the hardwood.

Gilmore—Has 80 acres of hardwood; no pine; no hemlock; 996 acres of plains partly covered with bushes and scattering trees; 520 acres of swamp partly covered with small timber and bushes and a few scattering trees.

Homestead—Has 9,600 acres of hardwood; no pine; 640 acres of hemlock; 4,800 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Inland—Has 8,380 acres of hardwood; 250 acres of pine; no hemlock; 2,500 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes; hemlock interspersed among the hardwood.

Joyfield—Has one fractional surveyed town; 3,400 acres of hardwood; no pine; no hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; no swamp; hemlock interspersed with the hardwood.

Lake—Has two fractional surveyed towns; 100 acres of hardwood; 500 acres of pine; no hemlock; 13,500 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Platte—Has 15,067 acres of hardwood; no pine; no hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; no swamp; hemlock interspersed among the hardwood.

Weldon—Has 8,000 acres of hardwood, mostly maple with some beech and elm; at the present rate of lumbering timber will all be gone in five years; no pine; 1,400 acres of hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

BERRIEN COUNTY

Has twenty organized townships, consisting of thirteen whole and thirteen fractional surveyed towns; 35,388 acres of hardwood; 230 acres of pine; 320 acres of hemlock; 9,922 acres of plains partly covered with bushes and scattering trees; 29,663 acres of swamp partly covered with small timber and bushes.

Bainbridge—2,400 acres of hardwood; no pine; no hemlock; no plains; 2,000 acres of swamp partly covered with small timber and bushes.

Benton—Has 1,500 acres of hardwood; no pine; no hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes. Something ought to be done to encourage the planting of forest trees in our township.

Berrien—Has 2,010 acres of hardwood; no pine; no hemlock; no plains; 2,209 acres of swamp partly covered with small timber and bushes.

Bertrand—Has two fractional surveyed towns; 1,000 acres of hardwood; no pine; no hemlock; no plains; 1,600 acres of swamp partly covered with small timber and bushes. A large drain is nearly completed which will make the marsh tillable in a short time.

Buchanan—Has one surveyed town; 5,800 acres of hardwood; no pine; no hemlock; no plains; 2,500 acres of swamp partly covered with bushes and small trees.

Chickaming—Has 1,000 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Galien—Has 900 acres of hardwood; no pine; no hemlock; 400 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes. The heavy timber has all been removed; only second grade left.

Hagar—Has one fractional surveyed town; 1,286 acres of hardwood; no pine; no hemlock; 2,719 acres of plains partly covered with bushes and scattering trees; 2,136 acres of swamp partly covered with small timber and bushes.

Lake—Has 800 acres of hardwood; 200 acres of pine; 300 acres of hemlock; 4,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes. The pine and hemlock in this township is scattering. This township has nearly every kind of timber known to this part of Michigan.

Lincoln—Has one fractional surveyed town; 200 acres of hardwood; 30 acres of pine; 20 acres of hemlock; 1,500 acres of plains partly covered with bushes and scattering trees; 800 acres of swamp partly covered with small timber and bushes.

New Buffalo—This township is in the extreme southwest corner of the State and has fractions of five surveyed towns in its territory; has 601 acres of hardwood; no pine; no hemlock; 240 acres of plains partly covered with bushes and scattering trees; no swamp.

Niles—Has 1,500 acres of hardwood; no pine; no hemlock; no plains; 100 acres of swamp partly covered with small timber and bushes.

Oronoko—Has 6,000 acres of hardwood, which is all heavy timber, consisting of beech, maple, basswood, poplar, elm and some heavy oak; no pine; no hemlock; no plains; 1,361 acres of swamp partly covered with small timber and bushes.

Pipestone—Has 1,900 acres of hardwood; no pine; no hemlock; no plains; 2,684 acres of swamp partly covered with small timber and bushes.

Royalton—Has one fractional surveyed town; 630 acres of hardwood; no pine; no hemlock; no plains; 773 acres of swamp partly covered with small timber and bushes.

Sodus—Has one fractional surveyed town; 420 acres of hardwood; no pine; no hemlock; 360 acres of plains partly covered with bushes and scattering trees; 120 acres of swamp partly covered with small timber and bushes.

St. Joseph—Has two fractional surveyed towns; 124 acres of hardwood; no pine; no hemlock; 253 acres of plains partly covered with bushes and scattering trees; 280 acres of swamp partly covered with small timber and bushes. About 75 acres of the plains are interspersed with second growth pine.

Three Oaks—Has 1,317 acres of hardwood; no pine; no hemlock; 450 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes.

Watervliet—Has 3,000 acres of hardwood; no pine; no hemlock; no plains; 1,500 acres of swamp partly covered with small timber and bushes.

Weesaw—Has 3,000 acres of hardwood; no pine; no hemlock; no plains; 10,000 acres of swamp partly covered with small timber and bushes. The forests in this township are in very good condition.

BRANCH COUNTY

Has sixteen organized townships, consisting of thirteen whole and three fractional surveyed towns; 24,901 acres of hardwood; no pine; no hemlock; 1,570 acres of plains partly covered with bushes and scattering trees; 12,858 acres of swamp partly covered with small timber and bushes.

Algansee—Has 2,803 acres of hardwood; no pine; no hemlock; no plains; 1,030 acres of swamp partly covered with small timber and bushes.

Batavia—Has 1,750 acres of hardwood; no pine; no hemlock; no plains; 2,600 acres of swamp partly covered with small timber and bushes; marsh land is partly covered with willow, tamarack, soft maple, elm and black ash.

Bethel—Has 1,050 acres of hardwood; no pine; no hemlock; 600 acres of plains partly covered with bushes and scattering trees; 900 acres of swamp partly covered with small timber and bushes.

Bronson—Has 1,800 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 400 acres of swamp partly covered with small timber and bushes; timber in this township consists of oak, ash, beech, maple, white wood, black walnut and cherry.

Butler—Has 2,155 acres of hardwood; no pine; no hemlock; no plains; no swamp.

California—Has one fractional surveyed town; 650 acres of hardwood; no pine; no hemlock; no plains; 350 acres swamp land partly covered with small timber and bushes; swamp timber is tamarack; the hardwood, especially oak, is dying rapidly.

Coldwater—Has 875 acres of hardwood; no pine; no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes.

Gilead—Has 400 acres of hardwood; no pine; no hemlock; 400 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes; timber is more or less culled.

Girard—Has 3,038 acres of hardwood; no pine; no hemlock; no plains; 1,286 acres of swamp partly covered with small timber and bushes; some cherry and walnut mixed with the hardwood.

Kinderhook—Has one fractional surveyed town; 2,850 acres of hardwood; no pine; no hemlock; no plains; 2,240 acres of swamp partly covered with small timber and bushes; hardwood consists of oak mixed with ash, hickory and elm.

Mattison—Has 1,000 acres of hardwood; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes.

Noble—Has one fractional surveyed town; 805 acres of hardwood; no pine; no hemlock; no plains; no swamp; most of the timber is very poor.

Ovid—Has 854 acres of hardwood; no pine; no hemlock; no plains; 2,562 acres of swamp partly covered with small timber and bushes.

Quincy—Has 924 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Sherwood—Has 3,200 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Union—Has 747 acres of hardwood; no pine; no hemlock; 370 acres of plains partly covered with bushes and scattering trees; 490 acres of swamp partly covered with small timber and bushes.

CALHOUN COUNTY

Has twenty organized townships, consisting of twenty surveyed towns; 27,571 acres of hardwood; 1 acre of pine; no hemlock; 6,060 acres of plains partly covered with bushes and scattering trees; 28,609 acres of swamp partly covered with small timber and bushes.

Albion—Has 1,100 acres of hardwood; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes; hardwood mostly second growth with an occasional pine fit for lumber.

Athens—Has 1,412 acres of hardwood; no pine; no hemlock; no plains; 405 acres of swamp partly covered with small timber and bushes.

Battle Creek—Has 1,150 acres of hardwood; no pine; no hemlock; no plains; 85 acres of swamp partly covered with small timber and bushes.

Bedford—Has 1,500 acres of hardwood; no pine; no hemlock; 500 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes.

Burlington—Has 2,000 acres of hardwood, consisting of oak, black ash and elm, with very little beech or maple; no pine; no hemlock; 540 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Clarence—Has 1,000 acres of hardwood; no pine; no hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes; timber is decaying in the heart at top or bottom of trees, but good in the center.

Clarendon—Has 2,106 acres of hardwood; no pine; no hemlock; no plains; 6,754 acres of swamp partly covered with small timber and bushes; there is but little timber fit for sawing left in this township.

Convis—Has 1,022 acres of hardwood; no pine; no hemlock; 922 acres of plains partly covered with bushes and scatttering trees; 3,561 acres of swamp partly covered with small timber and bushes.

Eckford—Has 1,680 acres of hardwood; no pine; no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes.

Emmet—Has 1,400 acres of hardwood, mostly oak, with some beech and maple; no pine; no hemlock; no plains; 1,200 acres of swamp partly covered with small timber and bushes.

Fredonia—Has 3,200 acres of hardwood; 1 acre of pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 800 acres of swamp mostly covered with tamarack.

Homer—Has 1,000 acres of hardwood; no pine; no hemlock; no plains; 4,000 acres of swamp partly covered with small timber and bushes.

Lee—Has 273 acres of hardwood; no pine; no hemlock; 300 acres of plains partly covered with bushes and scattering trees; 900 acres of swamp partly covered with small timber and bushes.

Le Roy—Has 1,196 acres of hardwood; no pine; no hemlock; 598 acres of plains partly covered with bushes and scattering trees; 2,096 acres of swamp partly covered with small timber and bushes.

Marengo—Has 977 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Marshall—Has 1,000 acres of hardwood; no pine; no hemlock; no plains; 308 acres of swamp partly covered with small timber and bushes.

Newton—Has 1,274 acres of hardwood; no pine; no hemlock; no plains; 4,500 acres of swamp partly covered with small timber and bushes; about 968 acres of the hardwood consists of black ash and elm.

Pennfield—Has 2,016 acres of hardwood; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes; the hardwood is mostly oak, with some hickory and cherry; swamps mostly covered with elm, black ash and tamarack.

Sheridan—Has 1,100 acres of hardwood; no pine; no hemlock; 300 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Tekonsha—Has 1,165 acres of hardwood; no pine; no hemlock; 1,900 acres of plains partly covered with bushes and scattering trees; 1,200 acres of swamp partly covered with small timber and bushes.

CASS COUNTY

Has fifteen organized townships, consisting of twelve full and four fractional surveyed towns; 28,468 acres of hardwood; no pine; 200 acres of hemlock; 2,846 acres of plains partly covered with bushes and scattering trees; 27,981 acres of swamp partly covered with small timber and bushes.

Calvin—Has 1,500 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes.

Howard—Has 2,200 acres of hardwood; no pine; no hemlock; no plains; 6,900 acres of swamp partly covered with small timber and bushes; about 2,000 acres of the hardwood is second-growth oak.

Jefferson—Has 2,300 acres of hardwood, nearly all second-growth oak; no pine; no hemlock; no plains; 2,289 acres of swamp partly covered with small timber and bushes.

LaGrange—Has 1,650 acres of hardwood; no pine; no hemlock; no plains; 1,160 acres of swamp partly covered with small timber and bushes; hardwood consists of beech, maple, oak, ash, basswood and whitewood.

Marcellus—Has 1,800 acres of hardwood; no pine; no hemlock; no plains; 800 acres of swamp land, part of which is covered with elm, black ash and bushes.

Mason—Has one fractional surveyed town; 1,424 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Milton—Has one fractional surveyed town; 1,424 acres of hardwood; no pine; no hemlock; no plains; no swamp; most of the timber fit for sawing is gone from this township.

Newberg—Has 3,000 acres of hardwood; no pine; no hemlock; no plains; 2,000 acres of swamp partly covered with small timber and bushes; the hardwood is mostly beech, maple, whitewood, black walnut, some basswood and ash; most of the good timber is gone.

Ontwa—Has one fractional surveyed town; 1,400 acres of hardwood; no pine; no hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes; the timber in this town is mostly second-growth oak, thick, thrifty and good.

Penn—Has 2,720 acres of hardwood; no pine; no hemlock; 720 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Pokagon—Has 2,072 acres of hardwood; no pine; no hemlock; no plains; 1,154 acres of swamp partly covered with small timber and bushes; the hardwood consists of maple, beech, oak, elm, ash, basswood and some black walnut; not much saw timber.

Porter—Has one whole and one fractional surveyed town; 3,740 acres of hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes; there are 250 acres of timber in this township that has never been culled.

Silver Creek—Has 1,000 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp partly covered with small timber and bushes; about half of the swamp land is covered with good black ash and swamp oak.

Volinia—Has 1,030 acres of hardwood, which contains some of the finest black walnut in the State; no pine; no hemlock; 726 acres of plains partly covered with bushes and scattering trees; 1,378 acres of swamp partly covered with small timber and bushes; swamps are covered with tamarack.

Wayne—Has 1,000 acres of hardwood; no pine; 200 acres of hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes.

CHARLEVOIX COUNTY

Has sixteen organized townships, consisting of nine whole and thirteen fractional surveyed towns; 82,854 acres of hardwood; 2,835 acres of pine; 10,934 acres of hemlock; 38,308 acres of plains partly covered with bushes and scattering trees; 19,220 acres of swamp partly covered with small timber and bushes.

Bay—Has one fractional surveyed town; 5,198 acres of hardwood; no pine; no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes; valuable timber has all been cut except 354 acres; some hemlock interspersed among the hardwood.

Boyne Valley—Has 1,800 acres of hardwood; no pine; no hemlock; 4,000 acres of plains partly covered with bushes and scattering trees; 3,000 acres of swamp partly covered with small timber and bushes; some hemlock interspersed among the hardwood.

Chandler—Has 14,000 acres of hardwood; no pine; 1,335 acres of hemlock; no plains; 3,840 acres of swamp partly covered with small timber and bushes; some pine is mixed with the hemlock and hardwood, and also with cedar in the swamp lands.

Chandler No. 2—Has five fractional surveyed towns; 480 acres of hardwood; 80 acres of pine; no hemlock; 7,434 acres of plains partly covered with bushes and scattering trees; 700 acres of swamp partly covered with small timber and bushes; there are several small islands belonging to this township, covered with bushes.

Charlevoix—Has one fractional surveyed town; no hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes.

Evangeline—Has one fractional surveyed town; 2,000 acres of hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes; hemlock scattered through the hardwood.

Eveline—Has one whole and one fractional surveyed town; 500 acres of hardwood; no pine; no hemlock; 9,466 acres of plains partly covered with bushes and scattering trees; 475 acres of swamp partly covered by small timber and bushes; there is no good timber for sawing left in the township.

Galilee—Has one fractional surveyed town; 6,000 acres of hardwood; 200 acres of pine; 4,000 acres of hemlock; 200 acres of plains partly covered with bushes and scattering trees; 400 acres of swamp partly covered with small timber and bushes.

Hayes—Has one whole and one fractional surveyed town; 5,870 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Hudson—Has 18,500 acres of hardwood, mostly maple with some beech, elm and basswood; no pine; no hemlock; no plains; 160 acres of swamp partly covered with small timber and bushes; some hemlock interspersed among the hardwood.

Marion—Has one fractional surveyed town; 3,130 acres of hardwood; 30 acres of pine; 1,345 acres of hemlock; no plains; 475 acres of swamp partly covered with small timber and bushes.

Melrose—Has 10,356 acres of hardwood, mostly maple with considerable ash, elm and beech; 557 acres of pine; 2,760 acres of hemlock; 2,862 acres of plains partly covered with bushes and scattering trees; 2,920 acres of swamp partly covered with small timber and bushes.

Norwood—Has one fractional surveyed town; 2,000 acres of hardwood, interspersed with hemlock; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp covered with "cut over" cedar.

Peaine—Has one fractional surveyed town; 1,200 acres of hardwood; 10 acres of pine; 60 acres of hemlock; 4,000 acres of plains partly covered with bushes and scattering trees; 900 acres of swamp partly covered with small timber and bushes; thousands of acres of pine and hardwood were destroyed by forest fires in 1895.

South Arm—Has 1,500 acres of hardwood; no pine; no hemlock; 7,346 acres of plains partly covered with bushes and scattering trees; 450 acres of swamp partly covered with small timber and bushes; hemlock is interspersed among hardwood, constituting about one-sixth; pine and cedar mixed in swamps.

Wilson—Has 10,320 acres of hardwood; 158 acres of pine; 1,434 acres of hemlock; no plains; no swamp; hemlock mixed with hardwood.

CHEBOYGAN COUNTY

Has fifteen organized townships, consisting of sixteen whole and twelve fractional surveyed towns; 138,155 acres of hardwood; 7,595 acres of pine; 33,446 acres of hemlock; 96,845 acres of plains partly covered with bushes and scattering trees; 61,003 acres of swamp partly covered with small timber and bushes.

Beaugrand—Has one fractional surveyed town; 500 acres of hardwood; no pine; 40 acres of hemlock; 8,000 acres of plains partly covered with bushes and scattering trees; 3,500 acres of swamp partly covered with small timber and bushes.

Benton—Has five fractional surveyed towns; 1,000 acres of hardwood; 100 acres of pine; 4,000 acres of hemlock; 15,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Burt—Has 7,360 acres of hardwood; no pine; 7,106 acres of hemlock; 4,340 acres of plains partly covered with bushes and scattering trees; 4,220 acres of swamp partly covered with small timber and bushes.

Ellis—Has two surveyed towns; 23,000 acres of hardwood; 1,000 acres of pine; 1,000 acres of hemlock; 6,400 acres of plains partly covered with bushes and scattering trees; 4,480 acres of swamp partly covered with small timber and bushes.

Forest—Has two surveyed towns; 2,500 acres of hardwood; 2,000 acres of pine; 5,000 acres of hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; 11,000 acres of swamp partly covered with small timber and bushes.

Grant—Has two whole and one fractional surveyed towns; 2,800 acres of hardwood; 540 acres of pine; 3,200 acres of hemlock; 5,000 acres of plains; partly covered with bushes and scattering trees; 3,200 acres of swamp partly covered with small timber and bushes.

Hebron—Has 6,500 acres of hardwood; no pine; 500 acres of hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; 7,200 acres of swamp partly covered with small timber and bushes; one half of harwood is maple, the remainder is beech, birch, elm and basswood, forty per cent of swamp is covered with tamarack, poplar and cedar.

Inverness—Has one whole and one fractional surveyed town; 2,500 acres of hardwood; no pine; 1,000 acres of hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes; pine is mixed with hemlock, cedar, small spruce and tamarack.

Mackinaw—Has one fractional surveyed town; 1,440 acres of hardwood; 355 acres of pine; 100 acres of hemlock; 2,105 acres of plains partly covered with bushes and scattering trees; 1,703 acres of swamp partly covered with small timber and bushes; pine and hemlock interspersed with hardwood; timber is small but dense.

Mentor—Has 5,000 acres of hardwood; no pine; no hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes; hardwood is interspersed with hemlock.

Monroe—Has 13,193 acres of hardwood with hemlock interspersed; no pine; 500 acres of hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Nunda—Has two whole surveyed towns; 8,000 acres of hardwood; 2,000 acres of pine; 8,000 acres of hemlock; 15,000 acres of plains partly covered with bushes and scattering trees; 10,000 acres of swamp partly covered with small timber and bushes.

Tuscarora—Has one whole and three fractional surveyed towns; 18,000 acres of hardwood; 1,000 acres of pine; 2,000 acres of hemlock; 18,000 acres of plains partly covered with bushes and scattering trees; 3,000 acres of swamp partly covered with small timber and bushes; hardwood consists of beech, maple, birch, basswood and grey elm interspersed with more or less pine and hemlock.

Waverly—Has 6,400 acres of hardwood; 600 acres of pine, 1,000 acres of hemlock; 11,000 acres of plains partly covered with bushes and scattering trees; 4,000 acres of swamp partly covered with small timber and bushes.

WILMOT—Has 17,462 acres of hardwood, with hemlock interspersed; no pine; no hemlock; no plains; 5,000 acres of swamp partly covered with small timber and bushes; swamps mostly covered with spruce and cedar.

CHIPPEWA COUNTY

Has twelve organized townships consisting of twenty-one whole and forty-six fractional surveyed towns; 254,787 acres of hardwood; 69,940 acres of pine; 119,570 acres of hemlock; 194,170 acres of plains partly covered with bushes and scattering trees; 139,325 acres of swamp partly covered with small timber and bushes.

BRUCE—Has two fractional towns; 10,640 acres of hardwood; 1,680 acres of pine; 11,520 acres of hemlock; 10,350 acres of plains partly covered with bushes and scattering trees; 5,980 acres of swamp partly covered with small timber and bushes; most of the valuable pine, oak, cedar and spruce have been cut; swamps are covered with whitewood, willow and tamarack.

DAFTER—Has six fractional surveyed towns; no hardwood; no pine; no hemlock; 6,000 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes; the standing forest is estimated at about 85,000 acres, of which 79,000 acres is mixed hardwood and softwood, and 6,000 acres is bushes and scattering trees.

DETOUR—Has four fractional surveyed towns; 10,640 acres of hardwood; 600 acres of pine; 5,000 acres of hemlock; 6,380 acres of plains partly covered with bushes and scattering trees; 4,000 acres of swamp partly covered with small timber and bushes.

DRUMMOND—Has ten fractional surveyed towns; 64,500 acres of hardwood; 1,900 acres of pine; 1,700 acres of hemlock; 1,300 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

PICKFORD—Has three whole and one fractional surveyed towns; 12,000 acres of hardwood; 1,280 acres of pine; 9,340 acres of hemlock; 8,620 acres of plains partly covered with bushes and scattering trees; no swamp.

RABER—Has two whole and two fractional surveyed towns; 29,267 acres of hardwood; 2,620 acres of pine; 15,890 acres of hemlock; no plains; 12,750 acres of swamp partly covered with small timber and bushes.

RUDYARD—Has two whole and two fractional surveyed towns; 2,000 acres of hardwood; no pine; no hemlock; 8,000 acres of plains partly covered with bushes and scattering trees; no swamp; this township has been burned over, but is now grown up with willow, black alder, poplar, etc.

SAULT STE. MARIE—Has two whole and three fractional surveyed towns; 12,000 acres of hardwood; 10,000 acres of pine; 20,000 acres of hemlock; 35,000 acres of plains partly covered with bushes and scattering trees; 40,000 acres of swamp partly covered with small timber and bushes.

Sugar Island—Has five fractional surveyed towns; 15,200 acres of hardwood consisting of maple and birch; no pine; 1,100 acres of hemlock; 1,440 acres of plains partly covered with bushes and scattering trees; 635 acres of swamp partly covered with small timber and bushes; oak has all been removed from the hardwood land.

Superior—Has five whole and four fractional surveyed towns; 32,700 acres of hardwood; 11,300 acres of pine; 35,500 acres of hemlock; 41,000 acres of plains covered with bushes and scattering trees; 35,100 acres of swamp partly covered with small timber and bushes; some of the swamp land includes what is known as "pulpwood lands," consisting of spruce, balsam and tamarack.

Trout Lake—Has three whole and three fractional surveyed towns; 18,000 acres of hardwood; 6,000 acres of pine; 8,000 acres of hemlock; 30,000 acres of plains partly covered with bushes and scattering trees; 4,000 acres of swamp partly covered with small timber and bushes; hardwood consists of maple, birch and beech; the forests of pine are small; hemlock is mixed with hardwood.

White Fish—Has four whole and four fractional surveyed towns; 46,080 acres of hardwood; 34,560 acres of pine; 11,520 acres of hemlock; 46,080 acres of plains partly covered with bushes and scattering trees; 34,560 acres of swamp partly covered with small timber and bushes.

CLARE COUNTY

Has thirteen organized townships, consisting of sixteen whole surveyed towns; 31,725 acres of hardwood; 440 acres of pine; 6,880 acres of hemlock; 64,210 acres of plains partly covered with bushes and scattering trees; 23,170 acres of swamp partly covered with small timber and bushes. This is less the township of Greenwood.

Arthur—Has 1,175 acres of hardwood, with hemlock interspersed, and consisting of oak, ash, elm, basswood and maple; no pine; no hemlock except as interspersed among hardwood; no plains; 460 acres of swamp partly covered with small timber and bushes.

Franklin—Has 1,920 acres of hardwood; no pine; 640 acres of hemlock; 18,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Frost—Has 1,080 acres of hardwood, with hemlock mixed about half and half; 160 acres of pine, consisting of what is known as buckwheat pine and is not of first quality; hemlock is mixed with the hardwood; 3,520 acres of plains partly covered with bushes and scattering trees; 1,440 acres of swamp covered with cedar, tamarack, balsam and spruce.

Grant—Has 524 acres of hardwood, with hemlock interspersed; no pine; 220 acres of hemlock; no plains; 750 acres of swamp partly covered with small timber and bushes.

Greenwood—Every effort was made to get the supervisor to make and return a forest schedule, but communications were all unanswered.

Hamilton—Has 500 acres of hardwood; no pine; 2,560 acres of hemlock; 300 acres of plains partly covered with bushes and scattering trees; 400 acres of swamp partly covered with small timber and bushes. Forest fires have badly damaged the hardwood timber.

Hatton—Has 200 acres of hardwood; no pine; 40 acres of hemlock; no plains; 1,400 acres of swamp partly covered with small timber and bushes.

Hayes—Has 36 acres of hardwood; no pine; 640 acres of hemlock; 21,000 acres of plains partly covered with bushes and scattering trees; 1,240 acres of swamp partly covered with small timber and bushes.

Redding—Has 17,000 acres of hardwood; no pine; 1,000 acres of hemlock; 1,000 acres of plains, mostly covered with jack pine; 3,000 acres of swamp covered more or less with cedar, black ash and elm. Most of the valuable hardwood timber has been removed.

Sheridan—Has 500 acres of hardwood; no pine; no hemlock; no plains; no swamp. All the saw timber in this township has been removed.

Summerfield—Has 2,560 acres of hardwood; 80 acres of pine; 1,280 acres of hemlock; 10,040 acres of plains, partly covered with bushes and scattering trees; 9,600 acres of swamp partly covered with small timber and bushes. All the timber in this township has been cut over except the 80 acres of small pine.

Surrey—Has 2,000 acres of hardwood; 200 acres of pine; 500 acres of hemlock; no plains; no swamp. A large amount of land formerly timbered with pine and hemlock is now growing up with small oak, soft maple, poplar, etc.

Winterfield—Has 3,630 acres of hardwood, with hemlock interspersed; no pine; no hemlock, except as interspersed with hardwood; 10,350 acres of plains, mostly covered with small jack pine and scrub oak; 2,880 acres of swamp, about one-eighth covered with small cedar and spruce.

CLINTON COUNTY

Has sixteen organized townships; 34,525 acres of hardwood; no pine; no hemlock; 900 acres of plains partly covered with bushes and scattering trees; 17,325 acres of swamp partly covered with small timber and bushes.

Bath—Has 1,934 acres of hardwood; no pine; no hemlock; no plains; 6,996 acres of swamp partly covered with small timber and bushes; hardwood nearly all second growth and not very valuable.

Bengal—Has 3,188 acres of hardwood, consisting of beech, maple, black ash, water elm, oak and basswood; no pine; no hemlock; no plains; 397 acres of swamp covered with willow bushes.

Bingham—Has 1,139 acres of hardwood, mostly beech and maple and some oak; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes.

Dallas—Has 2,920 acres of hardwood; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes.

De Witt—Has 1,794 acres of hardwood; no pine; no hemlock; no plains; 3,148 acres of swamp partly covered with small timber and bushes.

Du Plain—Has 1,200 acres of hardwood; no pine; no hemlock; 500 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes.

Eagle—Has 1,923 acres of hardwood; no pine; no hemlock; no plains; 809 acres of swamp partly covered with small timber and bushes.

Essex—Has 2,000 acres of hardwood; no pine; no hemlock; 400 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes; all timber has been culled more or less.

Greenbush—Has 2,500 acres of hardwood; no pine; no hemlock; no plains; 1,000 acres of swamp partly covered with small timber and bushes; considerable valuable oak in hardwood; 300 acres of swamps is covered with cedar, the remaining with willow, alder and scattering maple and elm.

Lebanon—Has 3,407 acres of hardwood; no pine; no hemlock; no plains; no swamp; about 1,080 acres of good hardwood timber; on the remainder the large timber has been taken off.

Olive—Has 2,000 acres of hardwood; no pine; no hemlock; no plains; 700 acres of swamp partly covered with small timber and bushes.

Ovid—Has 1,500 acres of hardwood; no pine; no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes.

Riley—Has 1,560 acres of hardwood; no pine; no hemlock; no plains; 1,450 acres of swamp partly covered with small timber and bushes.

Victor—Has 2,235 acres of hardwood; no pine; no hemlock; no plains; 75 acres of swamp partly covered with small timber and bushes; timber consists of oak, elm, basswood, black walnut, hickory, some maple, beech, cherry, ash and poplar.

Watertown—Has 2,200 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes.

Westphalia—Has 3,025 acres of hardwood; no pine; no hemlock; no plains; 350 acres of tamarack swamp; there are hundreds of acres of swamp partly cleared, not classed as timber lands.

CRAWFORD COUNTY

Has nine organized townships, consisting of sixteen whole surveyed towns; 15,455 acres of hardwood; 1,300 acres of hemlock; 173,643 acres of plains partly covered with bushes and scattering trees; 28,676 acres of swamp partly covered with small timber and bushes. This is less the township of Grayling.

Ball—Has 75 acres of hardwood; 8,420 acres of pine; no hemlock; 9,899 acres of plains partly covered with bushes and scattering trees; 1,280 acres of swamp partly covered with small timber and bushes.

Bear Creek—Has 1,920 acres of hardwood, with some hemlock interspersed; no pine; 9,600 acres of plains partly covered with bushes and scattering trees; 40 acres of swamp partly covered with small timber and bushes.

Blaine—Has two whole surveyed towns; no hardwood; 1,000 acres of pine; no hemlock; 35,864 acres of plains, covered with small oak and jack pine; 9,216 acres of swamp, covered with ash, elm, birch and spruce.

Center Plains—One surveyed town; has no hardwood; 80 acres of pine; no hemlock; 17,000 acres of plains partly covered with bushes and scattering trees; 4,000 acres of swamp partly covered with small timber and bushes.

Frederic—Has two whole surveyed towns; 8,960 acres of hardwood, nearly all maple and beech; 2,840 acres of pine; 800 acres of hemlock; 1,280 acres of plains partly covered with bushes and scattering trees; 640 acres of swamp partly covered with small timber and bushes.

Grayling—Has three whole surveyed towns. Several communications were sent to the supervisor of this township, each with a return stamped envelope, but no reply could be obtained from him.

Grove—Has two whole surveyed towns; no hardwood; no pine; no hemlock; 40,000 acres of plains partly covered with bushes and scattering trees; 5,500 acres of swamp partly covered with small timber and bushes. The valuable timber has all been cut, but a second growth more dense than the first is coming in its place.

Maple Forest—Has three whole surveyed towns; 4,000 acres of hardwood; 500 acres of pine; 500 hundred acres of hemlock; 50,000 acres of plains partly covered with bushes and scattering trees; 3,000 acres of swamp partly covered with small timber and bushes. The pine is scattering and the hemlock more or less mixed with hardwood.

South Branch—Has 500 acres of hardwood; 160 acres of pine; no hemlock; 15,000 acres of plains nearly all covered with jack pine and scrub oak; 5,000 acres of swamp, nearly covered with cedar, tamarack and spruce.

DELTA COUNTY

Has twelve organized townships consisting of twenty-two whole and thirty fractional surveyed towns; 129,357 acres of hardwood; 39,021 acres of pine; 111,408 acres of hemlock; 121,942 acres of plains partly covered with bushes and scattering trees; 158,647 acres of swamp partly covered with small timber and bushes.

Baldwin—Has three whole and one fractional surveyed towns; 40,000 acres of hardwood; 12,000 acres of pine; 10,000 acres of hemlock; 500 hundred acres of plains partly covered with bushes and scattering trees; 12,075 acres of swamp partly covered with small timber and bushes.

Bark River—Has 4,400 acres of hardwood; 50 acres of pine; 600 acres of hemlock; 6,000 acres of plains partly covered with bushes and scattering trees; 6,400 acres of swamp partly covered with small timber and bushes.

Bay De Noc—Has one whole and four fractional surveyed towns; 3,800 acres of hardwood; 1,240 acres of pine; 3,800 acres of hemlock; 2,500 acres of plains partly covered with bushes and scattering trees; 240 acres of swamp partly covered with small timber and bushes; the timber has nearly all been cut or burned over, but is being replaced by a second growth of poplar, birch, cherry and white maple.

Escanaba—Has two whole and one fractional surveyed towns; 10,582 acres of hardwood; 4,291 acres of pine; 8,951 acres of hemlock; 6,392 acres of plains partly covered with bushes and scattering trees; 12,582 acres of swamp partly covered with small timber and bushes.

Fairbanks—Has four fractional surveyed towns; 840 acres of hardwood; no pine; no hemlock; no plains; 11,760 acres of swamp partly covered with small timber and bushes.

Ford River—Has five fractional surveyed towns; 2,920 acres of hardwood; 240 acres of pine; 1,320 acres of hemlock; 28,000 acres of plains partly covered with bushes and scattering trees; 7,707 acres of swamp partly covered with small timber and bushes.

Garden—Has three whole and three fractional surveyed towns; 7,370 acres of hardwood, consisting of maple, beech, birch, basswood and elm; 8,200 acres of pine; 3,237 acres of hemlock; 18,750 acres of plains partly covered with bushes and scattering trees; 19,103 acres of swamp more or less covered with cedar, spruce and pine of an inferior grade.

Maple Ridge—Has three whole and one fractional surveyed towns; 8,170 acres of hardwood; no pine; 15,020 acres of hemlock; 12,000 acres of plains partly covered with bushes and scattering trees; no swamp; nearly all the pine is gone; timber consists of hardwood mixed with cedar, hemlock and pulpwood.

Masonville—Has five whole and one fractional surveyed towns; 23,040 acres of hardwood; no pine; 46,080 acres of hemlock; 23,040 acres of plains partly covered with bushes and scattering trees; 23,040 acres of swamp partly covered with small timber and bushes.

Nahma—Has three whole and five fractional surveyed towns; 22,000 acres of hardwood; 1,300 acres of pine; 22,000 acres of hemlock; 1,300 acres of plains partly covered with bushes and scattering trees; 50,000 acres of swamp partly covered with small timber and bushes.

Sack Bay—Has three fractional surveyed towns; 5,235 acres of hardwood, which is second growth, except about 500 acres of heavy forest; no pine; no hemlock; no plains; 3,740 acres of swamp covered with cedar, spruce, balsam and tamarack.

Wells—Has one whole, one half and one fractional surveyed town; 1,000 acres of hardwood; no pine; 400 acres of hemlock; 11,760 acres of plains; 12,000 acres of swamp partly covered with small timber and bushes. The estimate was made by competent persons through the courtesy of Hon. O. B. Fuller.

DICKINSON COUNTY

Has six organized townships, consisting of nineteen whole and six fractional surveyed towns; 164,233 acres of hardwood; 23,780 acres of pine; 12,100 acres of hemlock; 137,084 acres of plains partly covered with bushes and scattering trees; 65,100 acres of swamp partly covered with small timber and bushes. This is less the township Breitung.

Breen—Has four whole and one fractional surveyed towns; 76,000 acres of hardwood, with hemlock interspersed; 1,000 acres of pine; no hemlock; no plains; 26,000 acres of swamp partly covered with cedar and spruce. There is no hemlock forest standing alone in this township.

Breitung—Has two whole and three fractional surveyed towns. Every effort was made to have the supervisor make a return of forest statistics. No reply could be elicited from him.

Felch—Has five whole surveyed towns; 50,000 acres of hardwood; 18,000 acres of pine; not much hemlock; 28,000 acres of plains partly covered with bushes and scattering trees; 10,000 acres of swamp partly covered with small timber and bushes. The hardwood in this township has never been cut into, and is mostly maple with some basswood; the hemlock is very small.

Norway—Has two whole and one fractional surveyed towns; 10,500 acres of hardwood; 3,200 acres of pine; 9,300 acres of hemlock; 14,000 acres of plains which will some day be covered with the usual second growth timber; 9,100 acres of swamp, covered with cedar and tamarack. The second growth timber deserves protection as well as standing first growth.

Sagola—Has four whole surveyed towns; 22,000 acres of hardwood; 1,560 acres of pine; 2,300 acres of hemlock; 50,000 acres of plains partly covered with bushes and scattering trees; 14,000 acres of swamp partly covered with small timber and bushes.

Waucedah—Has two whole and one fractional surveyed towns; 5,733 acres of hardwood; 20 acres of pine; 500 acres of hemlock; 45,084 acres of plains partly covered with bushes and scattering trees; 6,000 acres of swamp partly covered with small timber and bushes.

EATON COUNTY

Has sixteen organized townships; 30,873 acres of hardwood; no pine; no hemlock; 5,450 acres of plains partly covered with bushes and scattering trees; 23,224 acres of swamp partly covered with small timber and bushes.

Bellevue—Has 1,215 acres of hardwood; one-half beech and maple, one-fourth oak and the remainder black ash and tamarack; no pine; no hemlock; no plains; no swamp.

Benton—Has 1,550 acres of hardwood; no pine; no hemlock; no plains; 630 acres of swamp partly covered with small timber and bushes.

Brookfield—Has 500 acres of hardwood; no pine; no hemlock; no plains; 5,760 acres of swamp partly covered with small timber and bushes.

Carmel—Has 3,000 acres of hardwood; no pine; no hemlock; no plains; 1,400 acres of swamp partly covered with small timber and bushes.

Chester—Has 4,500 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Delta—Has 800 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes.

Eaton—Has 1,100 acres of hardwood; no pine; no hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp partly covered with small trees and bushes.

Eaton Rapids—Has 1,500 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes.

Hamlin—Has 800 acres of hardwood; no pine; no hemlock; no plains; 1,200 acres of swamp partly covered with small timber and bushes.

Kalamo—Has 1,900 acres of hardwood; no pine; no hemlock; 450 acres of plains partly covered with bushes and small trees; 1,050 acres of swamp partly covered with small timber and bushes.

Oneida—Has 1,853 acres of hardwood; no pine; no hemlock; no plains; 2,110 acres of swamp partly covered with small timber and bushes.

Roxand—Has 3,500 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Sunfield—Has 1,350 acres of hardwood; no pine; no hemlock; no plains; 900 acres of swamp partly covered with small timber and bushes.

Vermontville—Has 2,292 acres of hardwood, mostly maple, beech and elm, with scattering ash, basswood, etc.; no pine; no hemlock; no plains; 665 acres of swamp partly covered with small timber and bushes.

Walton—Has 1,516 acres of hardwood; no pine; no hemlock; no plains; 2,459 acres of swamp partly covered with willow, tamarack, elm, soft maple and black ash; only about 100 acres of good hardwood timber.

Windsor—Has 3,497 acres of hardwood; no pine; no hemlock; no plains; 1,050 acres of swamp partly covered with small timber and bushes.

EMMET COUNTY

Has thirteen organized townships, consisting of eight whole and fifteen fractional surveyed towns; 142,258 acres of hardwood; 1,540 acres of pine; 26,160 acres of hemlock; 24,040 acres of plains partly covered with bushes and scattering trees; 31,640 acres of swamp partly covered with small timber and bushes.

Bear Creek—Has five fractional surveyed towns; 12,305 acres of hardwood; 40 acres of pine; 340 acres of hemlock; no plains; 160 acres of swamp partly covered with small timber and bushes.

Bliss—Has two fractional surveyed towns; 11,645 acres of hardwood; 300 acres of pine; no hemlock; 4,000 acres of plains partly covered with bushes and scattering trees; 3,900 acres of swamp partly covered with small timber and bushes; some hemlock interspersed among the hardwood.

CARP LAKE—Has one whole and one fractional surveyed town; 8,000 acres of hardwood; no pine; 4,000 acres of hemlock; 6,000 acres of plains partly covered with bushes and scattering trees; 9,000 acres of swamp partly covered with small timber and bushes.

CENTER—Has 7,830 acres of hardwood; no pine; 2,145 acres of hemlock; 3,700 acres of plains partly covered with bushes and scattering trees; 3,610 acres of swamp partly covered with small timber and bushes.

CROSS VILLAGE—Has two fractional surveyed towns; 500 acres of hardwood; 500 acres of pine; 2,000 acres of hemlock; 500 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

EGLESTON—Has 10,300 acres of hardwood; 280 acres of pine; 1,590 acres of hemlock; 7,340 acres of plains partly covered with bushes and scattering trees; 3,270 acres of swamp partly covered with cedar, hemlock and tamarack.

FRIENDSHIP—Has 20,000 acres of hardwood, interspersed with hemlock; no pine; 100 acres of hemlock; no plains; 40 acres of swamp covered with cedar.

LITTLEFIELD—Has one whole and one fractional surveyed town; 8,160 acres of hardwood; 420 acres of pine; 6,380 acres of hemlock; no plains; 1,200 acres of swamp partly covered with small timber and bushes.

LITTLE TRAVERSE—Has two fractional surveyed towns; 14,116 acres of hardwood, mixed with hemlock; no pine; no hemlock; no plains; no swamp.

MAPLE RIVER—Has 9,440 acres of hardwood, containing maple, beech, elm and basswood; no pine; 900 acres of hemlock; 2,500 acres of plains partly covered with bushes and scattering trees; 2,900 acres of swamp partly covered with small timber and bushes; the forest fires of 1895 did great damage to timber.

PLEASANT VIEW——Has 9,420 acres of hardwood; no pine; 8,705 acres of hemlock; no plains; 1,720 acres of swamp partly covered with small timber and bushes.

READMOND—Has two fractional surveyed towns; 15,000 acres of hardwood, with hemlock and pine interspersed; no other hemlock or pine; no plains; no swamp.

SPRING LAKE—Has 15,542 acres of hardwood, consisting of maple, birch, elm and basswood; no pine; no hemlock; no plains; 3,840 acres of swamp covered with cedar and tamarack, interspersed with pine, balsam and spruce.

GENESEE COUNTY

Has eighteen organized townships; 37,346 acres of hardwood; 225 acres of pine; no hemlock; 7,921 acres of plains partly covered with bushes and scattering trees; 7,993 acres of swamp partly covered with small timber and bushes.

ARGENTINE—Has 700 acres of hardwood; no pine; no hemlock; no plains; 600 acres of swamp partly covered with small timber and bushes.

Atlas—Has 4,028 acres of hardwood; no pine; no hemlock; no plains; 470 acres of swamp partly covered with small timber and bushes.

Burton—Has 1,227 acres of hardwood, consisting of beech, maple, oak, elm, hickory, ash, and basswood; no pine; no hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes; second growth timber looks very promising.

Clayton—Has 2,160 acres of hardwood, consisting of oak, elm, basswood, hickory, beech and maple; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes; most of the valuable timber has been cut.

Davison—Has 3,900 acres of hardwood; no pine; no hemlock; 300 acres of plains partly covered with bushes and scattering trees; 2,400 acres of swamp partly covered with small timber and bushes.

Fenton—Has 1,200 acres of hardwood; no pine; no hemlock; 400 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes.

Flint—Has 1,790 acres of hardwood; no pine; no hemlock; no plains; no swamp; nearly all timber fit for sawing has been removed.

Flushing—Has 3,500 acres of hardwood; no pine; no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes.

Forest—Has 800 acres of hardwood; no pine; no hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Gaines—Has 2,529 acres of hardwood, consisting of oak, beech, maple, basswood, elm, and ash; no pine; no hemlock; 878 acres of plains partly covered with bushes and scattering trees; 822 acres of swamp partly covered with small timber and bushes; most valuable timber gone.

Genesee—Has 1,275 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Grand Blanc—Has 1,450 acres of hardwood; no pine; no hemlock; 300 acres of plains partly covered with bushes and scattering trees; 150 acres of swamp partly covered with small timber and bushes.

Montrose—Has 1,000 acres of hardwood; 200 acres of pine; no hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes; timber nearly all of second growth or sorted several times and not of much value.

Mt. Morris—Has 5,300 acres of hardwood; no pine; no hemlock; 700 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes; timber principally consists of beech, maple, elm, oak and ash; not much valuable timber left.

Mundy—Has 2,300 acres of hardwood; no pine; no hemlock; no plains; 1,000 acres of swamp partly covered with small timber and bushes.

Richfield—Has 1,915 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Thetford—Has 992 acres of hardwood; 25 acres of pine; no hemlock; 703 acres of plains partly covered with bushes and scattering trees; 426 acres of swamp partly covered with small timber and bushes.

Vienna—Has 1,280 acres of hardwood; no pine; no hemlock; 640 acres of plains partly covered with bushes and scattering trees; 25 acres of swamp partly covered with small timber and bushes.

GLADWIN COUNTY

Has eleven organized townships, consisting of sixteen surveyed towns; 55,980 acres of hardwood; 3,160 acres of pine; 15,740 acres of hemlock; 90,900 acres of plains partly covered with bushes and scattering trees; 4,860 acres of swamp partly covered with small timber and bushes.

Beaverton—Has no hardwood; no pine; no hemlock; 20,000 acres plains covered with bushes; no swamp; township formerly timbered with elm, ash, basswood, cedar, hemlock, pine, birch, oak, and maple and now covered with a thick undergrowth.

Buckeye—Has two surveyed towns; 20,000 acres of hardwood; no pine; 2,000 acres of hemlock; 10,000 acres of plains partly covered with bushes and scattering trees; 3,000 acres of swamp partly covered with small timber and bushes; timber is soft maple, ash, basswood and oak; pine is nearly all gone.

Billings—Has 1,800 acres of hardwood; no pine; 400 acres of hemlock; 6,000 acres of plains partly covered with bushes and scattering trees; 7,200 acres of swamp partly covered with small timber and bushes.

Buckeye—Has two surveyed towns; 20,000 acres of hemlock; 10,000 acres of plains partly covered with bushes and scattering trees; 3,000 acres of swamp partly covered with small timber and bushes; timber is soft maple, ash, basswood and oak; pine is nearly all gone.

Butman—Has 2,000 acres of hardwood; no pine; 6,000 acres of hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Clement—Has two surveyed towns; 500 acres of hardwood; 600 acres of pine; 300 acres of hemlock; no plains; 4,000 acres of swamp partly covered with small timber and bushes; the forest fires of '95 and winds of '96 destroyed thousands of acres of standing timber.

Gladwin—Has three surveyed towns; 6,440 acres of hardwood; 2,560 acres of pine; 3,000 acres of hemlock; 19,200 acres of plains partly covered with bushes and scattering timber; 10,000 acres of swamp partly covered with small timber and bushes; the hardwood consists of maple, beech, birch, oak, ash, elm and basswood, interspersed with pine, hemlock and cedar.

Grout—Has 540 acres of hardwood; no pine; 200 acres of hemlock; 13,500 acres of plains partly covered with bushes and scattering trees; 4,480 acres of swamp partly covered with small timber and bushes; forest fires have severely damaged timber.

Sage—Has 16,300 acres of hardwood; no pine; 1,920 acres of hemlock; no plains; 1,920 acres of swamp partly covered with small timber and bushes; hardwood is interspersed with cedar and poplar.

Sherman—Has 6,400 acres of hardwood; no pine; 1,920 acres of hemlock; 3,200 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp partly covered with small timber and bushes.

Tobacco—Has no hardwood; no pine; no hemlock; 10,000 acres of plains partly covered by bushes and scattering trees; 11,000 acres of swamp partly covered with small timber and bushes; forest fires destroyed what little timber had not been removed.

GOGEBIC COUNTY

Has five organized townships, consisting of twenty-four whole and eighteen fractional surveyed towns; 536,800 acres of hardwood; 32,800 acres of pine; 47,000 acres of hemlock; 20,000 acres of plains partly covered with bushes and scattering trees; 43,000 acres of swamp partly covered with small timber and bushes.

Bessemer—Has three whole and three fractional surveyed towns; 50,800 acres of hardwood, consisting of birch and maple, with scattering basswood and a fine quality of pine and spruce; 6,000 acres of pine; 12,000 acres of hemlock; no plains; 18,000 acres of swamp, covered with cedar, tamarack and alder.

Ironwood—Has four whole and eight fractional surveyed towns; 100,000 acres of hardwood; 800 acres of pine; 5,000 acres of hemlock; 15,000 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp partly covered with small timber and bushes.

Marenisco—Has seven whole and three fractional surveyed towns; 186,000 acres of hardwood, consisting of a dense forest of hardwood, interspersed with hemlock and scattering pine; no separate pine or hemlock; no plains; no swamp.

Wakefield—Has four whole and two fractional surveyed towns; 118,000 acres of hardwood, consisting of maple and birch, interspersed with pine and hemlock; no separate pine or hemlock; no plains; no swamp.

Watersmeet—Has six whole and four fractional surveyed towns; 82,000 acres of hardwood, consisting of birch, maple, basswood and some elm, interspersed with pine; 26,000 acres of pine; 30,000 acres of hemlock, mixed with cedar; 5,000 acres of plains partly covered with bushes and scattering trees; 20,000 acres of swamp partly covered with small timber and bushes.

GRAND TRAVERSE COUNTY

Has thirteen organized townships, consisting of ten whole and seven fractional surveyed towns; 31,613 acres of hardwood; 4,369 acres of pine; 9,032 acres of hemlock; 90,363 acres of plains partly covered with bushes and scattering trees; 22,992 acres of swamp partly covered with small timber and bushes.

Acme—Has one fractional surveyed town; 1,890 acres of hardwood; no pine; 500 acres of hemlock; 4,000 acres of plains and 1,800 acres of swamp covered wholly or in part with bushes or scattering trees.

Blair—Has 2,000 acres of hardwood; 80 acres of pine; 800 acres of hemlock; 7,200 acres of plains partly covered with bushes and scattering trees; 6,400 acres of swamp partly covered with small timber and bushes; has about 600 acres once covered with hardwood, but now thickly grown up to bushes.

East Bay—Has two fractional surveyed towns; 2,067 acres of hardwood; 589 acres of pine; 410 acres of hemlock; 10,234 acres of plains, which are growing up with poplar and oak bushes; 1,082 acres of swamp partly covered with small timber and bushes. The standing pine in this township will all be lumbered off this year.

Fife Lake—Has 1,810 acres of hardwood; 80 acres of pine; 1,090 acres of hemlock; 12,710 acres of plains partly covered with bushes and scattering trees; 1,080 acres of swamp partly covered with small timber and bushes.

Garfield—Has two fractional surveyed towns; 1,000 acres of hardwood, with hemlock interspersed; no pine; 400 acres of hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 1,200 acres of swamp partly covered with small timber and bushes.

Grant—Has 7,362 acres of hardwood; no pine; no hemlock; 8,163 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes. Nearly all first-class timber has been cut over, but considerable of less value remains.

Green Lake—Has no hardwood; 780 acres of pine; no hemlock; 14,320 acres of plains, which are worthless stubble; 400 acres of swamp partly covered with small timber and bushes.

Long Lake—Has 6,720 acres of hardwood; 760 acres of pine; 852 acres of hemlock; 2,976 acres of plains partly covered with bushes and scattering trees; 270 acres of swamp partly covered with small timber and bushes. This township has a lake of the same name located nearly in the center of the township which covers a large area of land.

Mayfield—Has 2,440 acres of hardwood; no pine; 180 acres of hemlock; 2,840 acres of plains partly covered with bushes and scattering trees; 3,860 acres of swamp partly covered with small timber and bushes. Nearly all the merchantable timber in this township has been cut.

Paradise—Has one whole and one fractional surveyed township; 2,140 acres of hardwood; no pine; 2,000 acres of hemlock; 10,000 acres of plains partly covered with bushes and scattering trees; 2,800 acres of swamp partly covered with small timber and bushes. The hardwood, which is nearly all gone, consists of maple, elm, basswood and beech, with hemlock interspersed. The pine stump land is growing up with poplar, cherry and oak.

Peninsula—Has four fractional surveyed towns; 2,534 acres of hardwood, with hemlock interspersed; no pine; no hemlock, except as mixed with the hardwood; 6,000 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes.

UNION—Has 650 acres of hardwood; 80 acres of pine; 300 acres of hemlock; 600 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

WHITEWATER—Has 1,000 acres of hardwood; 2,000 acres of pine; 2,500 acres of hemlock; 9,320 acres of plains partly covered with bushes and scattering trees; 2,500 acres of swamp mostly covered with cedar.

GRATIOT COUNTY

Has seventeen organized townships, consisting of twelve whole and five parts of surveyed towns; 53,420 acres of hardwood; 30 acres of pine; no hemlock; 18,325 acres of plains partly covered with bushes and scattering trees; 15,715 acres of swamp partly covered with small timber and bushes.

ARCADA—Has one surveyed town, less one section; 2,459 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes.

BETHANY—Has 1,913 acres of hardwood, consisting of beech, maple, ash, elm, basswood, oak, birch, etc.; no pine; no hemlock; no plains; no swamp.

ELBA—Has 4,100 acres of hardwood; no pine; no hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; 3,400 acres of swamp partly covered with small timber and bushes; all timber valuable for sawing has been removed.

EMERSON—Has one surveyed town, less one section; 6,285 acres of hardwood, consisting of elm, ash, basswood, beech and maple; no pine; no hemlock; no plains; 3,440 acres of swamp partly covered with small timber and bushes; nearly all the hardwood timber has been culled.

FULTON—Has 3,614 acres of hardwood, nine-tenths of which is beech and maple, the remainder is elm and basswood and a very little oak and ash; no pine; no hemlock; 800 acres of plains partly covered with bushes and scattering trees; 1,150 acres of swamp partly covered with small timber and bushes.

HAMILTON—Has 3,300 acres of hardwood; 30 acres of pine; no hemlock; 6,000 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes.

ITHACA—Has only four sections, taken from four surveyed towns; 425 acres of hardwood; no pine; no hemlock; no plains; no swamp.

LAFAYETTE—Has 6,700 acres of hardwood; no pine; no hemlock; 400 acres of plains partly covered with bushes and scattering trees; 10 acres of swamp covered with tamarack; hardwood consists of elm, black ash, basswood, beech and maple.

NEWARK—Has one surveyed town, less one section; 2,333 acres of hardwood; no pine; no hemlock; 370 acres of plains partly covered with bushes and scattering trees; no swamp.

New Haven—Has 3,385 acres of hardwood; no pine; no hemlock; 175 acres of plains partly covered with bushes and scattering trees; 780 acres swamp; forest fires have greatly damaged timber in the last two years.

North Shade—Has 3,310 acres of hardwood; no pine; no hemlock; no plains; 220 acres of swamp partly covered with small timber and bushes.

North Star—Has one surveyed town, less one section; 2,447 acres of hardwood; no pine; no hemlock; no plains; 160 acres of swamp partly covered with small timber and bushes.

Pine River—Has 1,345 acres of hardwood; no pine; no hemlock; no plains; no swamp; forest fires and winds have damaged timber greatly.

Seville—Has 1,350 acres of hardwood, consisting of hard maple, elm and ash; no pine; no hemlock; 3,400 acres of plains partly covered with bushes and scattering trees; 1,400 acres of swamp partly covered with tamarack; stump lands partly covered with a scrub growth of poplar, cherry, maple and ash.

Sumner—Has 2,125 acres of hardwood; no pine; no hemlock; 2,180 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Washington—Has 4,074 acres of hardwood; no pine; no hemlock; no plains; 1,415 acres of swamp partly covered with small timber and bushes; most of the valuable timber is gone; remaining timber consists of beech, maple, black ash, basswood, elm and some oak.

Wheeler—Has 4,255 acres of hardwood, consisting of elm, black ash, soft maple and oak; no pine; no hemlock; no plains; 820 acres of swamp partly covered with small timber and bushes; all timber fit for sawing is gone.

HILLSDALE COUNTY

Has eighteen organized townships, consisting of sixteen whole and four fractional surveyed towns; 32,458 acres of hardwood; no pine; no hemlock; 2,350 acres of plains partly covered with bushes and scattering trees; 10,759 acres of swamp partly covered with small timber and bushes.

Adams—Has 1,000 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes. Years ago this township was covered with some of the best varieties of hardwood timber, but it is now all gone.

Allen—Has 1,000 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Amboy—Has two fractional surveyed towns; 3,025 acres of hardwood; no pine; no hemlock; 600 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Cambria—Has 660 acres of hardwood; no pine; no hemlock; no plains; 665 acres of swamp partly covered with small timber and bushes.

Camden—Has two fractional surveyed towns; 2,827 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Fayette—Has one fractional surveyed town; 800 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 150 acres of swamp partly covered with small timber and bushes.

Hillsdale—Has one fractional surveyed town; no hardwood; no pine; no hemlock; no plains; no swamp.

Jefferson—Has 450 acres of hardwood; no pine; no hemlock; 50 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Litchfield—Has 1,856 acres of hardwood, only fit for firewood; no pine; no hemlock; no plains; 3,764 acres of swamp partly covered with small timber and bushes. There is a great deal of marsh along the streams, some covered with willows.

Moscow—Has 2,400 acres of hardwood; no pine; no hemlock; no plains; 600 acres of swamp partly covered with small timber and bushes.

Pittsford—Has 4,200 acres of hardwood in small tracts and consists mostly of beech and maple, with very little sawing timber; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes.

Ransom—Has 2,840 acres of hardwood; no pine; no hemlock; no plains; 1,300 acres of swamp partly covered with small timber and bushes.

Reading—Has 2,000 acres of hardwood; no pine; no hemlock; no plains; 80 acres of swamp partly covered with small timber and bushes.

Scipio—Has 1,000 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Somerset—Has 3,000 acres of hardwood, consisting of oak, hickory and maple; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Wheatland—Has 2,700 acres of hardwood; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes.

Woodbridge—Has 700 acres of hardwood; no pine; no hemlock; 300 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Wright—Has one whole and one fractional surveyed town; 2,000 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes.

HOUGHTON COUNTY

Has twelve organized townships, consisting of twenty-two whole and thirteen fractional surveyed towns; 277,606 acres of hardwood; 41,750 acres of pine; 66,180 acres of hemlock; 108,473 acres of plains partly covered with bushes and scattering trees; 30,650 acres of swamp partly covered with small timber and bushes.

Adams—Has two whole and four fractional surveyed towns; 20,000 acres of hardwood; no pine; no hemlock, except as mixed with the hardwood; 2,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes; much of the hardwood has been cut over for the pine, leaving it nearly worthless; hemlock interspersed with the hardwood.

Calumet—Has two whole surveyed towns; 4,080 acres of hardwood; 140 acres of pine; 580 acres of hemlock; 520 acres of plains partly covered with bushes and scattering trees; 1,020 acres of swamp partly covered with small timber and bushes. This township contains about thirty-four sections of land, being in two surveyed towns. The famous Calumet and Hecla and several other large and important mines are located within its boundaries. Most of the timber was cut off years ago.

Chassell—Has one whole and one fractional surveyed town; 30,000 acres of hardwood; 100 acres of pine; 20,000 acres of hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Duncan—Has five whole surveyed towns; 43,260 acres of hardwood; 29,340 acres of pine; no hemlock; 39,060 acres of plains partly covered with bushes and scattering trees; 35,040 acres of swamp partly covered with small timber and bushes.

Franklin—Has one fractional surveyed town; 720 acres of hardwood; no pine; no hemlock; no plains; 250 acres of swamp partly covered with small timber and bushes.

Hancock—Has three whole surveyed towns; 40,000 acres of hardwood, but little scattering pine; 10,000 acres of hemlock; 10,000 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp partly covered with small timber and bushes.

Laird—Has five whole surveyed towns; 72,246 acres of hardwood, with hemlock scattered through the same; 9,610 acres of pine; 14,000 acres of hemlock; 15,000 acres of plains partly covered with bushes and scattering trees; 3,000 acres of swamp partly covered with small timber and bushes.

Osceola—Has two fractional surveyed towns; 4,000 acres of hardwood, with some pine and hemlock interspersed; 7,000 acres of plains, which are growing up with second growth timber same as the original; no swamp. Hardwood consists of maple, birch and basswood.

Portage—Has two whole and two fractional surveyed towns; 49,120 acres of hardwood; 2,240 acres of pine; 11,980 acres of hemlock; 12,493 acres of plains partly covered with bushes and scattering trees; 8,440 acres of swamp partly covered with small timber and bushes. The plains are lands where the principal part of the timber has been removed.

Quincy—Has one fractional surveyed town; 100 acres of hardwood; no pine; 20 acres of hemlock; 200 acres of plains partly covered with bushes and scattering trees; no swamp.

Schoolcraft—Has 6,400 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; no swamp. Timber consists of hard maple, birch, black ash, cedar, spruce and balsam.

Torch Lake—Has eight fractional surveyed towns; 7,680 acres of hardwood; 320 acres of pine; 9,600 acres of hemlock; 21,000 acres of plains partly covered with bushes and scattering trees; 6,400 acres of swamp partly covered with small timber and bushes.

HURON COUNTY

Has twenty-six organized townships, consisting of eighteen whole and thirteen fractional surveyed towns; 21,826 acres of hardwood; 430 acres of pine; 90 acres of hemlock; 56,306 acres of plains partly covered with bushes and scattering trees; 49,345 acres of swamp partly covered with small timber and bushes.

Bingham—Has 45 acres of hardwood; no pine; no hemlock; no plains; 10 acres of swamp partly covered with timber and bushes; the forest fires of 1871-81 destroyed all or nearly all the timber in this township.

Bloomfield—Has no hardwood; no pine; no hemlock; 17,613 acres of plains partly covered with bushes and scattering trees; no swamp; the forest fires of 1871-81 destroyed all or nearly all the timber in this township.

Brookfield—Has no hardwood; no pine; no hemlock; no plains; 14,000 acres of swamp covered more or less with poplar bushes, clumps of hemlock, pine, ash, elm, cedar and tamarack; this township is largely swamp lands.

Caseville—Has three fractional surveyed towns; 7,000 acres of hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; no swamp; timber consists of cedar, elm, basswood, maple, some oak, Norway pine, ash and hemlock; pine and hemlock interspersed among other timber.

Chandler—Has 3,600 acres of hardwood; no pine; no hemlock; no plains; 1,500 acres of swamp covered with second growth hemlock, ash, elm, etc.

Colfax—Has 25 acres of hardwood; 10 acres of pine; 20 acres of hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; no swamp.

DWIGHT—Has 200 acres of hardwood; no pine; no hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes; forest fires of 1871-81 destroyed all heavy timber; since then timber lands have grown up with poplar.

FAIR HAVEN—Has two fractional surveyed towns; 1,001 acres of hardwood; no pine; no hemlock; 1,140 acres of plains partly covered with bushes and scattering trees; 485 acres of swamp partly covered with small timber and bushes. A few scattering pine and hemlock are interspersed with the hardwood, which consists of hickory, oak, maple, beech, ash and elm.

GORE—Has one fractional surveyed town; no hardwood; no pine; no hemlock; 350 acres of plains partly covered with bushes and scattering trees; no swamp; no timber in this township.

GRANT—Has 300 acres of hardwood; no pine; 40 acres of hemlock; no plains; 640 acres of swamp partly covered with small timber and bushes. Forest fires destroyed nearly all the timber; timber land is now grown up with poplar, birch and willow.

HUME—Has 200 acres of hardwood; no pine; no hemlock; 2,500 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp timbered with oak, elm, basswood and soft maple; some hemlock mixed with hardwood, which consists largely of maple and beech.

HURON—Has two fractional surveyed towns; 25 acres of hardwood; no pine; no hemlock; 6,268 acres of plains covered with second growth poplar; 25 acres of swamp partly covered with small timber and bushes.

LAKE—Has one fractional surveyed town; 640 acres of hardwood, which has been partly lumbered over and consists of elm, ash, soft maple, hemlock and small quantities of pine; no pine; 20 acres of hemlock; 3,840 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes.

LINCOLN—Has no hardwood; no pine; no hemlock; no plains; 10,880 acres of swamp covered with poplar, black ash, elm, soft maple and cedar.

MEADE—Has no hardwood; 400 acres of pine; no hemlock; 9,600 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes; pine small and scattering.

OLIVER—Has 400 acres of hardwood; no pine; no hemlock; 350 acres of plains partly covered with bushes and scattering trees; 250 acres of swamp partly covered with small timber and bushes. This township has been devastated by fire on several occasions; all good timber has been sacrificed; we have no hardwood, even for fuel, which has not been burned over.

PARIS—Has 10 acres of hardwood; no pine; no hemlock; no plains; no swamp.

PORT AUSTIN—Has two fractional surveyed towns; 20 acres of hardwood; no pine; 10 acres of hemlock; 1,500 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

RUBICON—Has one fractional surveyed town; 50 acres of hardwood; no pine; no hemlock; no plains; 230 acres of swamp partly covered with small timber and bushes.

SAND BEECH—Has one whole and one fractional surveyed town; no hardwood; no pine; no hemlock; 7,000 acres of plains partly covered with bushes and scattering trees; no swamp; forest fires of 1871 and '81 destroyed nearly all the timber.

SEBEWAING—Has 3,750 acres of hardwood, consisting of elm, ash, basswood, beech, maple, hickory, cotton wood and a few oak, with a small amount of pine and hemlock interspersed; no pine; no hemlock; 145 acres of plains partly covered with bushes and scattering trees; 365 acres of swamp partly covered with small timber and bushes.

SHERIDAN—Has 3,000 acres of hardwood; no pine; no hemlock; no plains; 7,000 acres of swamp partly covered with small timber and bushes.

SHERMAN—Has one whole and one fractional surveyed town; 100 acres of hardwood; no pine; no hemlock; no plains; 6,700 acres of swamp partly covered with small timber and bushes.

SIGEL—Has 450 acres of hardwood; no pine; no hemlock; no plains; 4,960 acres of swamp partly covered with small timber and bushes.

VERONA—Has 10 acres of hardwood; 20 acres of pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes.

WINSOR—Has 1,000 acres of hardwood, mostly elm and ash; no pine; no hemlock; no plains; no swamp.

INGHAM COUNTY

Has sixteen organized townships; 36,120 acres of hardwood; no pine; no hemlock; 1,265 acres of plains partly covered with bushes and scattering trees; 17,296 acres of swamp partly covered with small timber and bushes.

ALAIEDON—Has 1,686 acres of hardwood; no pine; no hemlock; 75 acres of plains partly covered with bushes and scattering trees; 1,200 acres of swamp partly covered with small timber.

AURELIUS—Has 1,935 acres of hardwood; no pine; no hemlock; no plains; 100 acres of swamp partly covered with small timber and bushes.

BUNKER HILL—Has 2,004 acres of hardwood; no pine; no hemlock; no plains; 642 acres of swamp partly covered with small timber and bushes.

DELHI—Has 3,000 acres of hardwood; no pine; no hemlock; no plains; no swamp.

INGHAM—Has 364 acres of hardwood; no pine; no hemlock; 490 acres of plains partly covered with bushes and scattering trees; 1,007 acres of swamp partly covered with small timber and bushes.

LANSING—Has 750 acres of hardwood; no pine; no hemlock; no plains; 1,420 acres of swamp partly covered with small timber and bushes.

LE ROY—Has 5,420 acres of hardwood, consisting of elm, basswood, maple, beech, ash and some oak; no pine; no hemlock; no plains; 250 acres of swamp partly covered with small timber and bushes.

LESLIE—Has 2,300 acres of hardwood; no pine; no hemlock; no plains; 1,800 acres of swamp partly covered with small timber and bushes.

LOCKE—Has 1,484 acres of hardwood; no pine; no hemlock; no plains; 1,257 acres of swamp partly covered with small timber and bushes; valuable timber nearly all gone, that remaining consists of oak, beech, maple, elm and ash.

MERIDIAN—Has 2,600 acres of hardwood; no pine; no hemlock; 500 acres of plains partly covered with bushes and scattering trees; 2,400 acres of swamp, mostly covered with tamarack and black ash.

ONONDAGA—Has 2,000 acres of hardwood; no pine; no hemlock; no plains; 3,000 acres of swamp partly covered with small timber and bushes.

STOCKBRIDGE—Has 1,700 acres of hardwood; no pine; no hemlock; no plains; 600 acres of swamp covered with tamarack.

VEVAY—Has 1,500 acres of hardwood; no pine; no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes.

WHEATFIELD—Has 3,177 acres of hardwood, consisting of oak, beech, ash, maple, black walnut, elm and basswood; no pine; no hemlock; no plains; 120 acres of swamp covered with tamarack.

WHITE OAK—Has 3,400 acres of hardwood, mostly beech and maple, with some oak; no pine; no hemlock; no plains; 1,700 acres of swamp covered with tamarack, which has been nearly destroyed by fire.

WILLIAMSTON—Has 2,800 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp mostly covered with willow and tamarack; the greater part of the timber in this township is oak, interspersed with hickory, beech and maple.

IONIA COUNTY

Has sixteen townships; 27,532 acres of hardwood; 20 acres of pine; no hemlock; 1,810 acres of plains partly covered with bushes and scattering trees; 18,694 acres of swamp partly covered with small timber and bushes.

BERLIN—Has one whole and one fractional surveyed town; 2,000 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and small timber; all forests have been thinned out to some extent.

BOSTON—Has 2,229 acres of hardwood; no pine; no hemlock; no plains; 1,121 acres of swamp partly covered with small timber and bushes.

CAMPBELL—Has 3,030 acres of hardwood; no pine; no hemlock; 705 acres of plains partly covered with bushes and scattering trees; 1,835 acres of swamp partly covered with small timber and bushes.

Danby—Has 1,700 acres of hardwood; no pine; no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes; timber consists of oak, maple, beech, elm, basswood, hickory and tamarack; greater part of timber has been sorted over.

Easton—Has one fractional surveyed town; 3,000 acres of hardwood; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes.

Ionia—Has 200 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Keene—Has 2,790 acres of hardwood, consisting of maple, beech, oak, ash, elm and basswood; no pine; no hemlock; no plains; 375 acres of swamp, timbered with poplar, tamarack, and soft maple.

Lyons—Has 200 acres of hardwood; no pine; no hemlock; no plains; 1,000 acres of swamp partly covered with small timber and bushes; good timber has been cut off to a great extent to save it from the ravages of the worms.

North Plains—Has 1,600 acres of hardwood; no pine; no hemlock; 500 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes.

Odessa—Has 210 acres of hardwood; is principally beech and maple, but maple is dying out; no pine; no hemlock; no plains; 2,500 acres of swamp, partly covered with tamarack, and grown up to willows. There is soft maple, water elm and small trees on bottom lands. Farmers seem to be quite unconcerned about saving timber.

Orange—Has 1,344 acres of hardwood; no pine; no hemlock; 205 acres of plains partly covered with bushes and scattering trees; 1,270 acres of swamp partly covered with small timber and bushes.

Orleans—Has 1,800 acres of hardwood; 20 acres of pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Otisco—Has 2,630 acres of hardwood; no pine; no hemlock; no plains; 1,300 acres of swamp partly covered with small timber and bushes.

Portland—Has 1,536 acres of hardwood; no pine; no hemlock; no plains; 118 acres of swamp partly covered with small timber and bushes.

Ronald—Has 170 acres of hardwood; no pine; no hemlock; no plains; 5,000 acres of swamp partly covered with small timber and bushes; this township originally consisted of oak openings, but most of good timber is gone. Some stump lands which were allowed to grow again are quite well covered with second growth.

Sebewa—Has 3,093 acres of hardwood; no pine; no hemlock; no plains; 1,225 acres of swamp partly covered with small timber and bushes.

IOSCO COUNTY

Has eleven organized townships, consisting of thirteen whole and five fractional surveyed towns; 18,135 acres of hardwood; 2,700 acres of pine; 6,060 acres of hemlock; 148,855 acres of plains partly covered with bushes and scattering trees; 49,230 acres of swamp partly covered with small timber and bushes.

Alabaster—Has one fractional surveyed town; 5,000 acres of hardwood; 2,000 acres of pine; 4,000 acres of hemlock; 840 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Au Sable—Has one fractional surveyed town; no hardwood; no pine; no hemlock; 8,000 acres of plains partly wooded with jack pine and some scattering ash and oak; 7,000 acres of swamp partly covered with cedar and bushes.

Baldwin—Has two fractional surveyed towns; 550 acres of hardwood, mostly black ash and elm; no pine; 400 acres of hemlock; 2,500 acres of plains partly covered with bushes and scattering trees; 4,000 acres of swamp partly covered with small timber and bushes; all timber is small and of but little value.

Burleigh—Has 1,000 acres of hardwood; no pine; 500 acres of hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Grant—Has 640 acres of hardwood; no pine; 200 acres of hemlock; 5,760 acres of plains partly covered with bushes and scattering trees; no swamp.

Oscoda—Has four whole and one fractional surveyed town; 600 acres of hardwood; 400 acres of pine; no hemlock; 60,000 acres of plains partly covered with bushes and scattering trees; 10,000 acres of swamp partly covered with small timber and bushes.

Plainfield—Has two whole surveyed towns; no hardwood; no pine; no hemlock; 32,040 acres of plains partly covered with bushes and scattering trees; 4,000 acres of swamp partly covered with small timber and bushes; timber destroyed by forest fires.

Reno—Has 200 acres of hardwood; no pine; 200 acres of hemlock; 2,560 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Sherman—Has 9,920 acres of hardwood; 80 acres of pine; 640 acres of hemlock; 2,380 acres of plains partly covered with bushes and scattering trees; 1,780 acres of swamp partly covered with small timber and bushes; a large part of the merchantable hardwood has been cut; remainder consists largely of elm, black ash and soft maple.

Tawas—Has 200 acres of hardwood; 80 acres of pine; no hemlock; 4,480 acres of plains covered with scrub oak, jack pine, cedar and scattering Norway and white pine. Forest fires have destroyed thousands of acres of our timber; no swamps.

WILBER—Has two whole surveyed towns; 25 acres of hardwood; 140 acres of pine; 120 acres of hemlock; 25,295 acres of plains partly covered with bushes and scattering trees; 18,450 acres of swamp partly covered with small timber and bushes.

IRON COUNTY

Has eight organized townships, consisting of twenty-nine whole and eight fractional surveyed towns; 203,870 acres of hardwood; 31,860 acres of pine; 26,400 acres of hemlock; 54,300 acres of plains partly covered with bushes and scattering trees; 31,390 acres of swamp partly covered with small timber and bushes.

ATKINSON—Has four whole and one fractional surveyed towns; 47,370 acres of hardwood; 5,160 acres of pine; no hemlock; no plains; no swamp.

BATES—Has three whole and one fractional surveyed towns; 20,000 acres of hardwood; 12,000 acres of pine; 11,000 acres of hemlock; 15,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes. Hardwood consists of maple, elm, basswood and birch. Swamp land generally covered with spruce, cedar and tamarack.

CRYSTAL FALLS—Has six whole and one fractional surveyed towns; 1,500 acres of hardwood; 200 acres of pine; 400 acres of hemlock; 300 acres of plains partly covered with bushes and scattering trees; 1,390 acres of swamp partly covered with small timber and bushes.

HEMATITE—Has four whole and one fractional surveyed towns. The supervisor reports that there are 156 sections in this township, that the pine has all been cut off and that only 320 acres have been cleared of other timber. This would indicate that there is probably 75,000 acres of all kinds of timber left in this town.

IRON RIVER—Has four whole and one fractional surveyed towns; 25,000 acres of hardwood; 10,000 acres of pine; no hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp partly covered with small timber and bushes. A large portion of this township has been burned over by forest fires; and has several extensive iron mines.

MANSFIELD—Has three whole surveyed towns; 30,000 acres of hardwood; 2,500 acres of pine; 5,000 acres of hemlock; 17,000 acres of plains partly covered with bushes and scattering trees; 10,000 acres of swamp partly covered with small timber and bushes.

MASTODON—Has three whole and one fractional surveyed towns; 45,000 acres of hardwood; 2,000 acres of pine; 10,000 acres of hemlock; 20,000 acres of plains partly covered with bushes and scattering trees; 8,000 acres of swamp partly covered with small timber and bushes.

STAMBAUGH—Has eight fractional surveyed towns; 35,000 acres of hardwood; no pine nor hemlock, except as mixed with the hardwood; no plains; 6,000 acres of swamp partly covered with small timber and bushes; some pine and considerable hemlock mix with the hardwood.

ISABELLA COUNTY

Has sixteen organized townships; 46,613 acres of hardwood; 1 acre of pine; 7,680 acres of hemlock; 39,830 acres of plains partly covered with bushes and scattering trees; 30,990 acres of swamp partly covered with small timber and bushes.

Broomfield—Has 3,900 acres of hardwood; no pine; 380 acres of hemlock; 4,500 acres of plains partly covered with bushes and scattering trees; 1,200 acres of swamp partly covered with small timber and bushes; hardwood not of much value.

Chippewa—Has 2,940 acres of hardwood; no pine; 160 acres of hemlock; 10,500 acres of plains partly covered with bushes and scattering trees; no swamp.

Coe—Has 3,694 acres of hardwood, consisting of beech, maple, black ash, basswood, elm and oak; no pine; no hemlock; no plains; 913 acres of swamp covered with second growth of elm, black ash and tamarack; most of the valuable timber has been cut.

Coldwater—Has 2,800 acres of hardwood; no pine; 1,000 acres of hemlock; 8,320 acres of plains partly covered with bushes and scattering trees; 900 acres of swamp partly covered with small timber and bushes; some hemlock interspersed with the hardwood, and vice versa.

Deerfield—Has 3,726 acres of hardwood; no pine; 300 acres of hemlock; no plains; 1,149 acres of swamp partly covered with small timber and bushes; valuable hardwood all gone.

Denver—Has 450 acres of hardwood; no pine; no hemlock; no plains; 240 acres of swamp partly covered with small timber and bushes.

Fremont—Has 1,800 acres of hardwood; no pine; 600 acres of hemlock; no plains; 1,920 acres of swamp partly covered with small timber and bushes; township was once timbered with pine; the hemlock is dying; swamps are covered with cedar, tamarack, and pine.

Gilmore—Has 300 acres of hardwood; no pine; 900 acres of hemlock with hardwood interspersed; no plains; no swamp.

Isabella—Has 4,000 acres of hardwood, consisting of beech, maple, elm and basswood; no pine; no hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes.

Lincoln—Has 5,800 acres of hardwood; no pine; no hemlock; no plains; 3,000 acres of swamp partly covered with small timber and bushes; hardwood is not all heavy timber.

Nottawa—Has 10,000 acres of hardwood; no pine; 2,000 acres of hemlock; 960 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Rolland—Has 1,000 acres of hardwood; no pine; 1,200 acres of hemlock; 4,000 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes; timber greatly injured by forest fires and winds.

Sherman—Has 573 acres of hardwood; no pine; 630 acres of hemlock; 11,550 acres of plains partly covered with bushes and scattering trees; 1,280 acres of swamp partly covered with small timber and bushes.

Union—Has 3,000 acres of hardwood, with some hemlock interspersed; no pine; no hemlock; no plains; no swamp; most of valuable timber gone.

Vernon—Has 1,630 acres of hardwood; no pine; 310 acres of hemlock; no plains; 1,950 acres of swamp partly covered with small timber and bushes; timber consists of elm, soft maple, black ash, tamarack, and cedar; most of saw timber gone.

Wise—Has 1,000 acres of hardwood, consisting of maple, birch, ash, elm, oak and basswood; one acre of pine; 200 acres of hemlock; no plains; 15,738 acres of swamp, more or less covered with black ash, birch, poplar and elm.

JACKSON COUNTY

Has nineteen organized townships, consisting of twenty whole surveyed towns; 33,399 acres of hardwood; no pine; no hemlock; 750 acres of plains partly covered with bushes and scattering trees; 31,676 acres of swamp partly covered with small timber and bushes.

Blackman—Has 1,237 acres of hardwood, consisting largely of second growth oak and scattering hickory; no pine; no hemlock; no plains; 649 acres of swamp, mostly covered with ash, elm and soft maple.

Columbia—Has one whole and one fractional surveyed towns; 2,400 acres of hardwood; no pine; no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes; greater part of timber in this township is second growth oak.

Concord—Has 500 acres of hardwood; no pine; no hemlock; 100 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes.

Grass Lake—Has one whole and one fractional surveyed towns; 1,900 acres of hardwood, consisting of oak, hickory and beech; no pine; no hemlock; no plains; 2,145 acres of swamp, mostly covered with tamarack.

Hanover—Has 1,400 acres of hardwood; no pine; no hemlock; no plains; 454 acres of swamp partly covered with small timber and bushes.

Henrietta—Has two fractional surveyed towns; 2,468 acres of hardwood; no pine; no hemlock; no plains; 1,475 acres of swamp; there are 845 acres of tamarack included in the "swamp" land.

Leoni—Has one whole and two fractional surveyed towns; 250 acres of hardwood; no pine; no hemlock; no plains; 525 acres of swamp covered with tamarack.

Liberty—Has 1,500 acres of hardwood; no pine; no hemlock; no plains; no swamp. Varieties of timber are oak, hickory, ash, tamarack, maple, basswood, elm, poplar and cedar. Oak mostly second growth.

Napoleon—Has four fractional surveyed towns; 1,014 acres of hardwood; no pine; no hemlock; no plains; 2,420 acres of swamp partly covered with small timber and bushes.

Norvell—Has two fractional surveyed towns; 1,000 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes.

Parma—Has 3,000 acres of hardwood; no pine; no hemlock; no plains; 3,000 acres of swamp partly covered with small timber and bushes.

Pulaski—Has 2,600 acres of hardwood; no pine; no hemlock; 450 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Rives—Has 1,113 acres of hardwood; no pine; no hemlock; no plains; no swamp; about half of the number of acres reported above is sparsely timbered or of second growth.

Sandstone—Has 3,000 acres of hardwood, mostly oak and scattering hickory; no pine; no hemlock; no plains; 1,000 acres of swamp covered with elm, ash and bushes.

Spring Arbor—Has 2,300 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes.

Springport—Has 1,300 acres of hardwood; no pine; no hemlock; no plains; 1,500 acres of swamp partly covered with small timber and bushes; timber very scattering in this township.

Summit—Has 1,940 acres of hardwood, consisting of hickory, ash, elm, etc.; no pine; no hemlock; no plains; no swamp.

Tompkins—Has 1,000 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 5,750 acres of swamp partly covered with small timber and bushes; timber consists largely of oak, black ask and elm.

Waterloo—Has 3,477 acres of hardwood; no pine; no hemlock; no plains; 10,658 acres of swamp partly covered with small timber and bushes.

KALAMAZOO COUNTY

Has sixteen organized townships; 28,185 acres of hardwood; no pine; no hemlock; 965 acres of plains partly covered with bushes and scattering trees; 12,281 acres of swamp partly covered with small timber and bushes.

Alamo—Has 2,948 acres of hardwood; no pine; no hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes; timber in this township consists of beech, maple, oak, elm and black ash.

Brady—Has 565 acres of hardwood; no pine; no hemlock; no plains; 2,500 acres of swamp partly covered with small timber and bushes.

Charleston—Has 1,750 acres of hardwood; no pine; no hemlock; 45 acres of plains partly covered with bushes and scattering trees; 65 acres of swamp partly covered with small timber and bushes.

Climax—Has 2,143 acres of hardwood; no pine; no hemlock; no plains; no swamp; timber consists of oak, beech and maple.

Comstock—Has 1,000 acres of hardwood; no pine; no hemlock; 70 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes; timber consists of oak, beech, maple, hickory, basswood, whitewood, etc.

Cooper—Has 1,300 acres of hardwood; no pine; no hemlock; 850 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Kalamazoo—Has 1,000 acres of hardwood; no pine; no hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes.

Oshtemo—Has 2,174 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Pavilion—Has 3,400 acres of hardwood; no pine; no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes.

Portage—Has 1,717 acres of hardwood; no pine; no hemlock; no plains; 3,356 acres of swamp partly covered with small timber and bushes.

Prairie Ronde—Has 1,778 acres of hardwood; no pine; no hemlock; no plains; 1,260 acres of swamp partly covered with small timber and bushes.

Richland—Has 1,200 acres of hardwood; no pine; no hemlock; no plains; no swamp; but little original timber remaining; nearly all being second growth, principally oak and hickory.

Ross—Has 1,090 acres of hardwood; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes.

Schoolcraft—Has 520 acres of hardwood; consisting of scrub oak; no pine; no hemlock; no plains; 2,100 acres of swamp partly covered with bushes and tamarack.

Texas—Has 2,800 acres of hardwood; no pine; no hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes.

Wakeshma—Has 2,800 acres of hardwood, consisting of beech, maple, ash, elm, birch, whitewood and oak; no pine; no hemlock; no plains; 600 acres of swamp covered with tamarack.

KALKASKA COUNTY

Has twelve organized townships, consisting of sixteen surveyed towns; 114,943 acres of hardwood; 28,759 acres of pine; 21,635 acres of hemlock; 49,614 acres of plains partly covered with bushes and scattering trees; 17,727 acres of swamp partly covered with small timber and bushes.

Boardman—Has 6,400 acres of hardwood; 3,200 acres of pine; no hemlock; 4,000 acres of plains partly covered with small timber and bushes; 320 acres of swamp partly covered with small timber and bushes; hemlock interspersed among other timber.

Clearwater—Has three surveyed towns; 13,080 acres of hardwood; 3,193 acres of pine; 5,610 acres of hemlock; 11,822 acres of plains partly covered with bushes and scattering trees; 2,607 acres of swamp partly covered with small timber and bushes; pine interspersed with hemlock and hardwood; hemlock greatly injured by forest fires.

Cold Springs—Has 14,000 acres of hardwood; 200 acres of pine; 1,200 acres of hemlock; no plains; 1,500 acres of swamp partly covered with small timber and bushes.

Excelsior—Has 12,000 acres of hardwood; 1,000 acres of pine; 500 acres of hemlock; no plains; 7,040 acres of swamp partly covered with small timber and bushes.

Garfield—Has 8,950 acres of hardwood, interspersed with hemlock; 350 acres of pine; 300 acres of hemlock; 700 acres of plains partly covered with bushes and scattering trees; 1,370 acres of swamp partly covered with small timber and bushes.

Glade—Has 3,000 acres of hardwood; 6,400 acres of pine; 200 acres of hemlock; 13,182 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes.

Kalkaska—Has 2,600 acres of hardwood; no pine; 880 acres of hemlock; 8,000 acres of plains partly covered with bushes and scattering trees; 1,260 acres of swamp partly covered with small timber and bushes.

Oliver—Has 5,000 acres of hardwood; no pine; 3,000 acres of hemlock; 500 acres of plains partly covered with bushes and scattering trees; no swamp.

Orange—Has 8,113 acres of hardwood, interspersed with hemlock; 50 acres of pine; 5,405 acres of hemlock; no plains; 2,700 acres of swamp covered more or less with black ash, hemlock and some pine.

Rapid River—Has two surveyed towns; 22,320 acres of hardwood, interspersed throughout with hemlock; 3,606 acres of pine; no hemlock; 850 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Springfield—Has two surveyed towns; 13,080 acres of hardwood, with hemlock interspersed; 5,640 acres of pine; 2,540 acres of hemlock; 2,560 acres of plains partly covered with bushes and scattering trees; no swamp.

Wilson—Has 6,400 acres of hardwood; 5,120 acres of pine; 2,000 acres of hemlock; 8,000 acres of plains partly covered with bushes and scattering trees; 630 acres of swamp partly covered with small timber and bushes; hemlock interspersed with hardwood and vice versa.

KENT COUNTY

Has twenty-four organized townships; 51,731 acres of hardwood; 471 acres of pine; 1,000 acres of hemlock; 33,566 acres of plains partly covered with bushes and scattering trees; 24,588 acres of swamp partly covered with small timber and bushes.

Ada—Has 5,582 acres of hardwood; no pine; no hemlock; no plains; 2,120 acres of swamp partly covered with small timber and bushes.

Algoma—Has 1,000 acres of hardwood; no pine; no hemlock; 7,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

ALPINE—Has 2,160 acres of hardwood; 15 acres of pine; no hemlock; 30 acres of plains partly covered with bushes and scattering trees; 1,740 acres of swamp partly covered with small timber and bushes.

BOWNE—Has 2,766 acres of hardwood, consisting of beech, maple and oak; nearly all the oak is gone; beech and maple left is good; no pine; no hemlock; 737 acres of plains partly covered with bushes and scattering trees; 1,721 acres of swamp, mostly covered with a second growth tamarack and elm.

BYRON—Has 3,500 acres of hardwood; no pine; no hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 3,000 acres of swamp partly covered with small timber and bushes.

CALEDONIA—Has 2,300 acres of hardwood; no pine; no hemlock; no plains; 600 acres of swamp partly covered with small timber and bushes; about one-fourth of hardwood consists of "oak openings;" a large part of the valuable timber has been cut.

CANNON—Has 2,000 acres of hardwood; 71 acres of pine; no hemlock; no plains; 1,000 acres of swamp partly covered with small timber and bushes.

CASCADE—Has 565 acres of hardwood; no pine; no hemlock; 1,958 acres of plains partly covered with bushes and scattering trees; 250 acres of swamp partly covered with small timber and bushes.

COURTLAND—Has 2,088 acres of hardwood; no pine; no hemlock; 280 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes; timber has been nearly all sorted.

GAINES—Has 3,280 acres of hardwood, consisting of beech and maple, interspersed with ash, elm, basswood, oak and hickory; 10 acres of pine; no hemlock; no plains; 80 acres of swamp partly covered with small timber and bushes.

GRAND RAPIDS—Has 55 acres of hardwood; no pine; no hemlock; 2,700 acres of plains partly covered with bushes and scattering trees; 250 acres of swamp partly covered with small timber and bushes.

GRATTAN—Has 2,212 acres of hardwood; no pine; no hemlock; no plains; 4,721 acres of swamp covered with tamarack, willow, alder and some elm and ash.

LOWELL—Has 3,456 acres of hardwood, consisting of oak, maple, beech, elm, basswood, ash, whitewood and poplar; no pine; no hemlock; no plains; 1,152 acres of swamp partly covered with tamarack and bushes; oak, elm, basswood and ash are being used up very fast.

NELSON—Has 600 acres of hardwood, consisting of beech and maple; no pine; 800 acres of hemlock, interspersed with ash; 2,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes. Report made by the county surveyor as the supervisor failed to do so.

OAKFIELD—Has 1,000 acres of hardwood; 25 acres of pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Paris—Has 650 acres of hardwood; 40 acres of pine; no hemlock; 400 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes.

Plainfield—Has 6,000 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes. Valuable saw timber nearly gone; what remains is principally second growth.

Solon—Has 1,763 acres of hardwood; no pine; no hemlock; 7911 acres of plains partly covered with bushes and scattering trees; 760 acres of swamp partly covered with small timber and bushes. All valuable timber has been cut.

Sparta—Has 2,470 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes; timber consists principally of beech, maple, elm and swamp oak.

Spencer—Has 3,100 acres of hardwood; 10 acres of pine; no hemlock; 3,430 acres of plains partly covered with bushes and scattering trees; no swamp.

Tyrone—Has 1,000 acres of hardwood; 300 acres of pine; 200 acres of hemlock; 500 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Vergennes—Has 2,500 acres of hardwood; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes.

Walker—Has 1,484 acres of hardwood; no pine; no hemlock; 2,920 acres of plains partly covered with bushes and scattering trees; 1,044 acres of swamp partly covered with small timber and bushes.

Wyoming—Has 200 acres of hardwood; no pine; no hemlock; 700 acres of plains partly covered with bushes and scattering trees; 350 acres of swamp partly covered with small timber and bushes.

KEWEENAW COUNTY

Has five organized townships, consisting of three whole and twelve fractional surveyed towns; 74,710 acres of hardwood; 9,888 acres of pine; 15,080 acres of hemlock; 31,680 acres of plains partly covered with bushes and scattering trees; 60,892 acres of swamp partly covered with small timber and bushes.

Allouez—Has one whole and two fractional surveyed towns; 4,160 acres of hardwood; 3,600 acres of pine; 12,080 acres of hemlock; 2,480 acres of plains partly covered with bushes and scattering trees; 400 acres of swamp partly covered with small timber and bushes; there are no pure pine or hemlock forests; all are interspersed with hardwood.

Eagle Harbor—Has two fractional surveyed towns; 7,750 acres of hardwood; 385 acres of pine; no hemlock; 5,500 acres of plains partly covered with bushes and scattering trees; 17,662 acres of swamp partly covered with small timber and bushes.

GRANT—Has two whole and two fractional surveyed towns; 30,000 acres of hardwood; 5,000 acres of pine; 3,000 acres of hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; 30,000 acres of swamp partly covered with small timber and bushes.

HOUGHTON—Has three fractional surveyed towns; 12,800 acres of hardwood; 700 acres of pine; no hemlock; 10,000 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes; hardwood consists of maple, birch, oak, basswood, ash and elm, interspersed with cedar, spruce and balsam.

SHERMAN—Has three fractional surveyed towns; 20,000 acres of hardwood; 200 acres of pine; no hemlock; 8,700 acres of plains partly covered with bushes and scattering trees; 12,630 acres of swamp partly covered with small timber and bushes.

LAKE COUNTY

Has thirteen organized townships, consisting of sixteen surveyed towns; 19,345 acres of hardwood; 9,052 acres of pine; 2,635 acres of hemlock; **92,570** acres of plains partly covered with bushes and scattering trees; **26,313** acres of swamp partly covered with small timber and bushes.

CHASE—Has 800 acres of hardwood, consisting of beech and maple; no pine; no hemlock; 5,800 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp covered with small tamarack and cedar.

CHERRY VALLEY—Has no hardwood; no pine; no hemlock; 5,760 acres of plains, mostly covered with jack pine; 6,000 acres of swamp partly covered with small timber and bushes; hardwood timber has all been cut.

DOVER—Has 8,260 acres of hardwood, consisting of beech, maple, birch, elm, basswood and ash; 180 acres of pine; 900 acres of hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes; large tracts of timber have been destroyed by fire.

EDEN—Has no hardwood; 340 acres of pine; no hemlock; 3,500 acres of plains partly covered with bushes and scattering trees; no swamps.

ELK—Has three surveyed towns; 720 acres of hardwood; 1,160 acres of pine; no hemlock; 2,080 acres of plains partly covered with bushes and scattering trees; no swamp; some pine and hemlock interspersed among the hardwood.

ELLSWORTH—Has 5,225 acres of hardwood; 2,497 acres of pine; 755 acres of hemlock; no plains; 933 acres of swamp partly covered with small timber and bushes.

GLENCOE—Has 1,500 acres of hardwood, consisting of maple, beech, basswood, elm and birch; 3,255 acres of pine; no hemlock; 4,570 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with tamarack, balsam, hemlock, ash and birch; hemlock interspersed among other timber.

Lake—Has 1,280 acres of hardwood; no pine; no hemlock; 18,560 acres of plains partly covered with bushes and scattering trees; 1,200 acres of swamp partly covered with small timber and bushes.

Newkirk—Has 920 acres of hardwood; 760 acres of pine; 880 acres of hemlock; 3,360 acres of plains partly covered with bushes and scattering trees; 3,400 acres of swamp partly covered with small timber and bushes; most of the hardwood has been cut over more or less.

Pinora—Has 640 acres of hardwood; no pine; no hemlock; 1,500 acres of plains partly covered with bushes and scattering trees; 80 acres of swamp partly covered with small timber and bushes.

Pleasant Plains—Has no hardwood; 160 acres of pine; no hemlock; 10,000 acres of plains partly covered with bushes and scattering trees; 600 acres of swamp partly covered with small timber and bushes.

Webber—Has two surveyed towns; no hardwood; 500 acres of pine; no hemlock; 30,400 acres of plains partly covered with oak bushes and scattering trees; 3,000 acres of swamp, covered more or less with cedar, elm, soft maple and black ash.

Yates—Has no hardwood; 200 acres of pine; 100 acres of hemlock; 7,040 acres of plains covered with scrub oak and jack pine; 3,000 acres of swamp partly covered with small timber and bushes.

LAPEER COUNTY

Has eighteen and one-half surveyed towns; eighteen organized townships. There are 24,095 acres of hardwood; 120 acres of pine; 55 acres of hemlock; 34,244 acres of plains, covered with bushes and scattering timber and 21,609 acres of swamps, the latter having more or less timber and bushes; generally, timber in swamps is valueless.

Almont—Has one surveyed town; 800 acres of hardwood; 40 acres of pine; 20 acres of hemlock; no plains and 900 acres of swamp partly covered with bushes and scattering trees. The hardwood consists of beech, maple, elm, and basswood; swamps are timbered with ash, elm, soft maple, tamarack, birch and poplar.

Arcada—Has one surveyed town; 215 acres of hardwood; 8,000 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp. There is no standing pine or hemlock in this township. The plains are covered with second growth oak, poplar and sassafras.

Attica—Has one surveyed town; 1,000 acres of hardwood; 3,150 acres of plains and 2,570 acres of swamp partly covered with bushes and scattering trees. The hardwood consists of beech, maple, oak, elm and ash.

Burlington—Has one surveyed town; 1,000 acres of hardwood; 160 acres of hemlock; 1,600 acres of plains and 800 acres of swamp partly covered with bushes and scattering trees.

Burnside—Has one whole and one-half of another town; 1,530 acres of hardwood; 2,100 acres of swamp covered with bushes or scattering trees. This township has no standing pine nor hemlock; forest fires have destroyed nearly all the timber.

Deerfield—Has one surveyed town; 500 acres of hardwood; no standing pine nor hemlock; 10,000 acres of plains; 800 acres of swamp covered with bushes or scattering trees.

Dryden—Has one surveyed town; 1,725 acres of hardwood; 20 acres of pine; 10 acres of hemlock; 389 acres of plains, and 468 acres of swamp partly covered with bushes and scattering trees. The greater part of the hardwood is second growth and consists of maple, oak, elm, beech and basswood.

Elba—Has one surveyed town; 2,000 acres of hardwood; 600 acres of plains and 2,160 acres of swamp covered with bushes or scattering trees. The timber in this township consists of oak, maple, elm, tamarack, and black ash.

Goodland—Has one surveyed town; 1,569 acres of hardwood; no pine; no hemlock; 1,260 acres of plains and 4,566 acres of swamp partly covered with bushes and scattering trees. The varieties of timber are maple, beech, basswood, black ash and elm.

Hadley—Has one surveyed town; 2,280 acres of hardwood; no pine; no hemlock; 800 acres of swamp partly covered with bushes and scattering trees. Nearly all the saw timber is gone.

Imlay—Has one surveyed town; 300 acres of hardwood; 20 acres of pine; no hemlock; 1,500 acres of plains and 1,000 acres of swamp covered with bushes and scattering trees.

Lapeer—Has one surveyed town; 2,350 acres of hardwood; 40 acres of pine; no hemlock; 1,000 acres of swamp partly covered with bushes and scattering trees.

Marathon—Has one surveyed town; 930 acres of hardwood; 25 acres of hemlock; 305 acres of plains and 215 acres of swamp partly covered with bushes and scattering trees.

Mayfield—Has one surveyed town; 1,340 acres of hardwood; no pine; no hemlock; 1,240 acres of plains partly covered with bushes and scattering trees.

Metamora—Has one surveyed town; 2,186 acres of hardwood; no pine; no hemlock; 400 acres of swamp partly covered with bushes or scattering trees. The hardwood consists of beech, maple, elm, basswood, ash and second growth oak.

North Branch—Has one surveyed town; 3,000 acres of hardwood; no pine; no hemlock; 1,000 acres of plains and 200 acres of swamp partly covered with bushes and scattering trees. Much of the timber has been destroyed by fire.

Oregon—Has one surveyed town; 370 acres of hardwood; no pine; no hemlock; 3,200 acres of plains and 130 acres of swamp partly covered with bushes and scattering trees. The timber in this township consists of beech, maple, elm, black ash and cedar.

Rich—Has one surveyed town; was once heavily wooded, now has 1,000 acres of hardwood; no pine nor hemlock; 2,000 acres of plains covered with bushes and scattering trees; 2,000 acres of swamp, most of which is on either side of a sluggish stream that flows through the township. On two occasions forest fires have destroyed large amounts of timber.

LEELANAU COUNTY

Has eleven organized townships, consisting of one whole and twenty-two fractional surveyed towns; which includes certain outlying islands, 46,133 acres of hardwood; no pine; 6,900 acres of hemlock; 32,655 acres of plains partly covered with bushes and scattering trees; 6,121 acres of swamp partly covered with small timber and bushes.

Bingham—Has one fractional surveyed town; 1,000 acres of hardwood; no pine; no hemlock; no plains; 825 acres of swamp partly covered with small timber and bushes. Nearly all the merchantable timber has been removed.

Centerville—Has one fractional surveyed town; 6,000 acres of hardwood, with hemlock interspersed; no pine; no hemlock, except as interspersed among hardwood; no plains; 500 acres of swamp covered with cedar and tamarack.

Cleveland—Has two fractional surveyed towns; 1,820 acres of hardwood; no pine; 200 acres of hemlock; 2,560 acres of plains partly covered with bushes and scattering trees; 2,240 acres of swamp partly covered with small timber and bushes.

Elmwood—Has one fractional surveyed town; 1,000 acres of hardwood; no pine; no hemlock; no plains; no swamp. This township lays on the west side of Grand Traverse bay; is a fractional township containing part of two surveyed towns; has about twenty-one sections of land. There is about 9,000 acres of second growth timber on land where original timber has been taken off.

Empire—Has one fractional surveyed town; 2,000 acres of hardwood, pretty well thinned out and consisting of beech, oak, elm, ash, basswood, cherry and maple; no pine; 1,800 acres of hemlock; 11,000 acres of plains partly covered with bushes and scattering trees; 640 acres of swamp partly covered with small timber and bushes.

Glen Arbor—Has three fractional surveyed towns; 2,000 acres of hardwood, with some hemlock interspersed; no pine; no hemlock except as interspersed among hardwood; 4,500 acres of plains partly covered with bushes and scattering trees; 400 acres of swamp, covered more or less, with cedar, tamarack, ash and birch.

Kasson—Has one whole and part of another town; 16,720 acres of hardwood, consisting of maple, beech, birch, elm, basswood, ash and cherry with some hemlock interspersed; no pine; no hemlock, except as mixed with hardwood; 80 acres of plains partly covered with bushes and scattering trees; 20 acres of swamp partly covered with small timber and bushes.

Leelanau—Has four fractional surveyed towns; 4,000 acres of hardwood, consisting chiefly of maple, ash, beech, basswood, elm, etc., with some hemlock interspersed; no pine; 200 acres of hemlock; no plains; 800 acres of swamp partly covered with small timber and bushes.

Leland—Has two fractional surveyed towns; 4,493 acres of hardwood; no pine; no hemlock, except as interspersed with other timber; 14,415 acres of plains partly covered with bushes and scattering trees; 446 acres of swamp partly covered with small timber and bushes. Hemlock interspersed with the hardwood and swamp timber.

Solon—Has one fractional surveyed town; 6,670 acres of hardwood; no pine; 4,600 acres of hemlock, with hardwood and cedar interspersed; no plains; 210 acres of swamp partly covered with small timber and bushes.

Sutton's Bay—Has one fractional surveyed town; 430 acres of hardwood; no pine; 100 acres of hemlock; 100 acres of plains partly covered with bushes and scattering trees; 40 acres of swamp partly covered with small timber and bushes.

LENAWEE COUNTY

Has twenty-two organized townships, consisting of twenty whole and five parts of towns; 38,873 acres of hardwood; no pine; on hemlock; 6,741 acres of plains partly covered with bushes and scattering trees; 8,873 acres of swamp partly covered with small timber and bushes.

Adrian—Has 1,440 acres of hardwood; no pine; no hemlock; no plains; 130 acres of swamp partly covered with small timber and bushes; hardwood consists of oak, hickory, ash and maple, swamps timbered with soft maple and elm.

Blissfield—Has one fractional surveyed town; 1,380 acres of hardwood; no pine; no hemlock; no plains; no swamp; timber consists of oak, ash, elm, basswood, sycamore, cotton and whitewood.

Cambridge—Has 1,440 acres of hardwood; no pine; no hemlock; no plains; no swamp; all valuable timber has been removed.

Clinton—Has one fractional surveyed town; 664 acres of hardwood; no pine; no hemlock; no plains; 65 acres of swamp partly covered with small timber and bushes.

Deerfield—Has two fractional surveyed towns; 795 acres of hardwood; no pine; no hemlock; no plains; 4 acres of swamp partly covered with small timber and bushes; timber has all been sorted over.

Dover—Has 600 acres of hardwood; no pine; no hemlock; 100 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Fairfield—Has one whole and one fractional surveyed town; 4,655 acres of hardwood; no pine; no hemlock; no plains; 107 acres of swamp partly covered with small timber and bushes; timber is fast disappearing; that which remains consists of scattering oak, hickory, elm, basswood and black ash.

Franklin—Has 1,786 acres of hardwood, consisting of oak, maple, hickory, elm, black ash and basswood; no pine; no hemlock; no plains; 215 acres of swamp scantily timbered with tamarack.

Hudson—Has 1,800 acres of hardwood; no pine; no hemlock; 150 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Macon—Has 2,300 acres of hardwood; no pine; no hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes; very little valuable timber remains in this township.

Madison—Has 1,545 acres of hardwood, consisting of oak, ash, beech, maple, basswood and elm; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes.

Medina—Has one whole and one fractional town; 3,172 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Ogden—Has one whole and one fractional surveyed town; 2,043 acres of hardwood; no pine; no hemlock; no plains; 100 acres of swamp partly covered with small timber and bushes; dry weather injured timber to a great extent.

Palmyra—Has 1,100 acres of hardwood; no pine; no hemlock; 2,500 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes; most of valuable hardwood is gone.

Raisin—Has 1,011 acres of hardwood; no pine; no hemlock; 1,131 acres of plains partly covered with bushes and scattering trees; 811 acres of swamp partly covered with small timber and bushes.

Ridgeway—Has one fractional surveyed town; 600 acres of hardwood; no pine; no hemlock; no plains; 100 acres of swamp partly covered with small timber and bushes; nearly all the valuable timber has been removed; estimate does not include old choppings.

Riga—Has one whole and one fractional surveyed town; 2,900 acres of hardwood; no pine; no hemlock; 2,050 acres of plains partly covered with bushes and scattering trees; no swamp; timber consists of oak, maple, beech, hickory, elm, cottonwood, ash and basswood; timber greatly injured by drouth and a species of canker worm.

Rollin—Has 2,000 acres of hardwood; no pine; no hemlock; no plains; 600 acres of swamp partly covered with small timber and bushes; northern part of the township consists of oak openings; southern part of beech, maple, oak, ash, whitewood, walnut, elm, etc.

Rome—Has 3,890 acres of hardwood; no pine; no hemlock; no plains; 365 acres of swamp partly covered with small timber and bushes.

Seneca—Has one whole and one fractional surveyed town; 1,500 acres of hardwood; no pine; no hemlock; 800 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes; hardwood consists of beech, maple, elm and black ash; most of the oak has been removed.

Tecumseh—Has one fractional surveyed town; 400 acres of hardwood; no pine; no hemlock; 10 acres of plains partly covered with bushes and scattering trees; 50 acres of swamp partly covered with small timber and bushes.

Woodstock—Has 1,852 acres of hardwood, principally oak; no pine; no hemlock; no plains; 2,426 acres of swamp partly covered with ash and elm.

LIVINGSTON COUNTY

Has sixteen organized townships; 31,496 acres of hardwood; 4 acres of pine; no hemlock; 4,246 acres of plains partly covered with bushes and scattering trees; 20,876 acres of swamp partly covered with small timber and bushes.

Brighton—Has 2,417 acres of hardwood, mostly second growth white oak; no pine; no hemlock; no plains; 200 acres of swamp covered principally with tamarack.

Cohoctah—Has 3,002 acres of hardwood; no pine; no hemlock; no plains; 4,597 acres of swamp covered more or less with tamarack, elm and ash; nearly all the valuable timber has been removed.

Conway—Has 3,400 acres of hardwood; no pine; no hemlock; 600 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes; valuable timber all gone.

Deerfield—Has 2,091 acres of hardwood, consisting principally of oak; no pine; no hemlock; no plains; 786 acres of swamp partly covered with small timber and bushes; but little valuable timber left in this township.

Genoa—Has 1,000 acres of hardwood; no pine; no hemlock; 600 acres of plains partly covered with bushes and scattering trees; 850 acres of swamp partly covered with small timber and bushes.

Green Oak—Has 5,000 acres of hardwood; no pine; no hemlock; no plains; 3,000 acres of swamp partly covered with small timber and bushes.

Handy—Has 1,027 acres of hardwood; no pine; no hemlock; 1,318 acres of plains partly covered with bushes and scattering trees; 3,302 acres of swamp partly covered with small timber and bushes; hardwood severely culled; what remains consists principally of oak; moist lands covered with black ash, elm and basswood.

Hamburg—Has 1,387 acres of hardwood; no pine; no hemlock; no plains; 390 acres of swamp partly covered with small timber and bushes; nearly all the saw timber has been removed.

Hartland—Has 2,650 acres of hardwood; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes.

Howell—Has 610 acres of hardwood; 4 acres of pine; no hemlock; 1,104 acres of plains partly covered with bushes and scattering trees; 1,118 acres of swamp partly covered with small timber and bushes.

Iosco—Has 2,360 acres of hardwood; no pine; no hemlock; no plains; 1,780 acres of swamp partly covered with willows and tamarack.

Marion—Has 1,222 acres of hardwood; no pine; no hemlock; no plains; 670 acres of swamp partly covered with small timber and bushes.

Oceola—Has 1,440 acres of hardwood; no pine; no hemlock; 384 acres of plains partly covered with bushes and scattering trees; 1,350 acres of swamp partly covered with small timber and bushes.

PUTNAM—Has 620 acres of hardwood, consisting largely of second-class oak; no pine; no hemlock; 240 acres of plains partly covered with bushes and scattering trees; 670 acres of swamp partly covered with willow, poplar and tamarack.

TYRONE—Has 1,800 acres of hardwood, mostly second growth oak; no pine; no hemlock; no plains; 600 acres of swamp partly covered with small timber and bushes.

UNADILLA—Has 1,470 acres of hardwood; no pine; no hemlock; no plains; 163 acres of swamp covered with tamarack.

LUCE COUNTY

This county is one of the newer counties of the State. It has twenty-five whole surveyed towns and two fractions. There are but four organized townships. Every effort within the means of the Bureau was made to secure the statistics of the timber still remaining within its border, but through the failure of the supervisors of two of its townships to respond nothing could be obtained from the larger part of its territory. Excepting the townships of Columbus and McMillan it has 40,000 acres of hardwood; 5,000 acres of pine; 12,000 acres of hemlock; 4,000 acres of plains partly covered with bushes and scattering trees; 44,120 acres of swamp partly covered with small timber and bushes.

COLUMBUS—Has four whole surveyed towns. Several communications, with stamped return envelopes, were sent to the supervisor of this township, but no reply could be obtained.

LAKEFIELD—Has two whole surveyed towns; 20,000 acres of hardwood; consisting of beech, maple, birch, ash, elm and basswood; no pine; 4,000 acres of hemlock, of fine quality; no plains; 12,000 acres of swamp partly covered with cedar and bushes.

MCMILLAN—Has sixteen whole and two fractional surveyed towns. It is the largest township in the State, there being more territory than there is in many entire counties. Every effort was made to get some forest statistics from the supervisor, but he failed to respond to any communication, although several return, stamped envelopes, were sent to him.

PENTLAND—Has three whole surveyed towns; 20,000 acres of hardwood; 5,000 acres of pine; 8,000 acres of hemlock; 4,000 acres of plains partly covered with bushes and scattering trees; 32,120 acres of swamp partly covered with cedar and bushes. The hardwood in this township is good; hemlock is shakey, with some good cedar in the swamps.

MACKINAC COUNTY

Has twelve organized townships, consisting of eighteen whole and thirty-two fractional surveyed towns; 179,850 acres of hardwood; 10,563 acres of pine; 58,700 acres of hemlock; 71,849 acres of plains partly covered with bushes and scattering trees; 133,414 acres of swamp partly covered with small timber and bushes.

Bois Blanc—Has two fractional surveyed towns; no pine; 1,000 acres of hemlock; 100 acres of plains partly covered with bushes and scattering trees; 6,000 acres of swamp well timbered with cedar.

Brevort—Has two whole and one fractional surveyed towns; 2,500 acres of hardwood; no pine; 5,000 acres of hemlock; 5,529 acres of plains partly covered with bushes and scattering trees; 42,009 acres of swamp partly covered with small timber and bushes.

Cedar—Has four fractional surveyed towns; 17,740 acres of hardwood; 1,600 acres of pine; 9,500 acres of hemlock; 1,450 acres of plains partly covered with bushes and scattering trees; 2,450 acres of swamp partly covered with small timber and bushes; pine mixed with hardwood, except in one instance; timber in swamps consists of small cedar, balsam, fir, spruce and tamarack; there is a great field that might be improved by starting a second growth of pine; hardwood is maple, beech, birch and ironwood; estimate made by county surveyor and supervisor.

Garfield—Has two whole and three fractional surveyed towns; 41,600 acres of hardwood; 2,800 acres of pine; 19,000 acres of hemlock; 3,200 acres of plains partly covered with bushes and scattering trees; 4,500 acres of swamp partly covered with small timber and bushes. The hardwood consists of hard maple, birdseye maple, birch, beech, some elm and black ash, about in the order named; the pine is mixed with other timber, and at no place does it prevail as a timber by itself; the timber is estimated by county surveyor.

Hendricks—Has three whole and three fractional surveyed towns; 30,000 acres of hardwood, consisting of maple, birch and beech; 2,725 acres of pine; 15,000 acres of hemlock; 30,000 acres of plains partly covered with bushes and scattering trees; 18,000 acres of swamp, covered with cedar and tamarack; there is hemlock interspersed among the hardwood and pine.

Holmes—Has one fractional surveyed town; this township consists of Mackinac Island and is nearly all a State park.

Marquette—Has two whole and two fractional surveyed towns; 20,170 acres of hardwood; no pine; 500 acres of hemlock; 19,200 acres of plains partly covered with bushes and scattering trees; 16,000 acres of swamp partly covered with small timber and bushes.

Moran—Has one whole and seven fractional surveyed towns; 13,540 acres of hardwood, consisting of beech, birch and maple; 1,228 acres of pine; 1,000 acres of hemlock; 2,500 acres of plains partly covered with bushes and scattering trees; 11,930 acres of swamp partly covered with small timber and bushes.

Newton—Has four whole and two fractional surveyed towns; 30,000 acres of hardwood; no pine; 2,000 acres of hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp partly covered with small timber and bushes.

Portage—Has two whole surveyed towns; 8,000 acres of hardwood; no pine; no hemlock; no plains; 12,000 acres of swamp partly covered with small timber and bushes.

Sherwood—Has one whole and two fractional surveyed towns; 5,300 acres of hardwood; 2,210 acres of pine; 5,700 acres of hemlock; 2,950 acres of plains partly covered with bushes and scattering trees; 3,525 acres of swamp partly covered with small timber and bushes. The hardwood consists of hard maple, beech, birch, black ash, elm and ironwood. Pine is mixed with other timber and in no place exists by itself; estimate made by county surveyor.

St. Ignace—Has one whole and five fractional surveyed towns; 6,000 acres of hardwood; no pine; no hemlock; 1,920 acres of plains partly covered with bushes and scattering trees; 12,000 acres of swamp partly covered with small timber and bushes.

MACOMB COUNTY

Has fourteen organized townships, consisting of eleven whole and three fractional surveyed towns; 24,738 acres of hardwood; 5 acres of pine; no hemlock; 7,200 acres of plains partly covered with bushes and scattering trees; 10,642 acres of swamp partly covered with small timber and bushes.

Armada—Has 1,300 acres of hardwood; no pine; no hemlock; no plains; 700 acres of swamp partly covered with small timber and bushes; most of the timber is second growth; the valuable timber has been removed.

Bruce—Has 1,820 acres of hardwood; 5 acres of pine; no hemlock; no plains; no swamp.

Chesterfield—Has one fractional surveyed town; no hardwood; no pine; no hemlock; no plains; no swamp.

Clinton—Has 700 acres of hardwood; no pine; no hemlock; 1,400 acres of plains partly covered with bushes and scattering trees; 70 acres of swamp partly covered with small timber and bushes.

Erin—Has one fractional surveyed town; 809 acres of hardwood, consisting of oak, ash, elm, basswood, hickory and maple; no pine; no hemlock; 100 acres of plains partly covered with bushes or scattering trees; 312 acres of swamp or marsh.

Harrison—Has one fractional surveyed town; 200 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Lenox—Has 4,200 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Macomb—Has 2,500 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes.

Ray—Has 250 acres of hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 250 acres of swamp partly covered with small timber and bushes; varieties of hardwood are elm, basswood, beech and hard maple.

Richmond—Has 1,430 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; no swamp.

Shelby—Has 2,000 acres of hardwood; no pine; no hemlock; 2,600 acres of plains partly covered with bushes and scattering trees; 3,200 acres of swamp partly covered with small timber and bushes.

Sterling—Has 6,000 acres of hardwood; no pine; no hemlock; no plains; 810 acres of swamp partly covered with small timber and bushes; much timber has been destroyed by cyclones.

Warren—Has 2,000 acres of hardwood, consisting of oak, elm, ash, basswood, beech, maple, and hickory; no pine; no hemlock; 1,900 acres of plains partly covered with bushes and scattering trees; 1,800 acres of swamp covered with willow, tamarack and poplar.

Washington—Has 1,529 acres of hardwood, consisting of oak, elm, basswood, maple and beech; no pine; no hemlock; no plains; no swamp.

MANISTEE COUNTY

Has twelve organized townships, consisting of thirteen whole and five fractional surveyed towns; 43,668 acres of hardwood; 6,527 acres of pine; 12,813 acres of hemlock; 90,307 acres of plains partly covered with bushes and scattering trees; 14,764 acres of swamp partly covered with small timber and bushes.

Arcadia—Has one fractional surveyed town; 420 acres of hardwood, consisting of maple, elm, basswood, beech and ash, with hemlock interspersed; no pine; no hemlock; no plains; 680 acres of swamp partly covered with small timber and bushes.

Bear Lake—Has 5,860 acres of hardwood; no pine; 500 acres of hemlock; no plains; 640 acres of swamp partly covered with small timber and bushes.

Brown—Has three whole surveyed towns; 4,685 acres of hardwood, consisting of maple, beech, elm, birch, ash and basswood; 1,580 acres of pine; no hemlock; 32,000 acres of plains partly covered with bushes and scattering trees; 3,930 acres of swamp covered with cedar and tamarack; hemlock interspersed among the hardwood.

Cleon—Has 6,154 acres of hardwood; no pine; 500 acres of hemlock; 7,827 acres of plains partly covered with bushes and scattering trees; 894 acres of swamp partly covered with small timber and bushes.

Filer—Has one fractional surveyed town; 1,000 acres of hardwood; no pine; no hemlock; 4 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Manistee—Has two fractional surveyed towns; 145 acres of hardwood; no pine; no hemlock; 16,700 acres of plains partly covered with bushes and scattering trees; no swamp.

Maple Grove—Has 1,840 acres of hardwood, with some hemlock interspersed; 820 acres of pine; 3,160 acres of hemlock; 5,760 acres of plains partly covered with bushes and scattering trees; 5,400 acres of swamp partly covered with small timber and bushes.

Marilla—Has 10,580 acres of hardwood, with hemlock interspersed; 1,280 acres of pine; no hemlock; 6,400 acres of plains partly covered with bushes and scattering trees; 1,280 acres of swamp partly covered with small timber and bushes.

Onekama—Has one fractional surveyed town; no hardwood; no pine; no hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes. What timber has not been chopped has been destroyed by winds and fire.

Pleasanton—Has 3,500 acres of hardwood; no pine; 200 acres of hemlock; 6,000 acres of plains partly covered with bushes and scattering trees; no swamp; lumbering, wind storms and fire have played sad havoc with the once beautiful forests in this township.

Springdale—Has 9,172 acres of hardwood, consisting of maple, elm, basswood and cherry; no pine; 5,172 acres of hemlock; 6,356 acres of plains partly covered with bushes or scattering trees; no swamp.

Stronach—Has one fractional surveyed town; 312 acres of hardwood; 2,847 acres of pine, with hemlock interspersed; 3,281 acres of hemlock; 7,260 acres of plains covered with scrub oak, cedar, small hemlock, black ash and elm; 940 acres of swamp partly covered with small timber and bushes.

MARQUETTE COUNTY

Has sixteen organized townships, consisting of forty-six whole and eleven fractional surveyed towns; 269,105 acres of hardwood; 85,690 acres of pine; 90,006 acres of hemlock; 240,112 acres of plains partly covered with bushes and scattering trees; 180,166 acres of swamp partly covered with small timber and bushes. This is less the township of Champion.

Champion—Has four whole and two fractional towns. The supervisor failed to return the acres of various kinds of timber or to make any estimate of the same.

Chocolay—Has two fractional surveyed towns; 16,000 acres of hardwood, with hemlock interspersed; no pine; 5,000 acres of hemlock; 26,000 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp partly covered with small timber and bushes.

Ely—Has four whole surveyed towns; 10,000 acres of hardwood; 8,400 acres of pine; 2,500 acres of hemlock; 45,000 acres of plains partly covered with bushes and scattering trees; 22,160 acres of swamp partly covered with small timber and bushes.

Forsyth—Has nine whole surveyed towns; 45,045 acres of hardwood, consisting of maple, birch and elm, with some pine and hemlock interspersed; 11,420 acres of pine; 24,506 acres of hemlock; 76,605 acres of plains partly covered with bushes and scattering trees; 49,500 acres of swamp partly covered with small timber and bushes.

Humboldt—Has two whole and one fractional surveyed towns; 75 acres of hardwood; 1,000 acres of pine; 1,400 acres of hemlock; 1,500 acres of plains partly covered with bushes and scattering trees; 4,000 acres of swamp partly covered with small timber and bushes.

Ishpeming—Has three whole and three fractional surveyed towns; 40,000 acres of hardwood, with pine and hemlock interspersed; 20,000 acres of pine; 4,000 acres of hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp partly covered with small timber and bushes.

Marquette—Has five fractional surveyed towns; 24,630 acres of hardwood; 3,100 acres of pine; 8,600 acres of hemlock; no plains; 4,100 acres of swamp partly covered with cedar and hemlock.

Michigamme—Has four whole and two fractional surveyed towns; 50,000 acres of hardwood; 15,000 acres of pine; no hemlock; no plains; no swamp.

Negaunee—Has three fractional surveyed towns; 2,560 acres of hardwood; no pine; no hemlock; 19,566 acres of plains partly covered with bushes and scattering trees; 4,480 acres of swamp covered with an inferior quality of cedar, spruce and balsam; hardwood consists chiefly of scrubby maple and birch.

Republic—Has three whole and one fractional surveyed towns; 27,000 acres of hardwood; 25,000 acres of pine; no hemlock; 10,000 acres of plains partly covered with bushes and scattering trees; 15,000 acres of swamp partly covered with small timber and bushes.

Richmond—Has one whole and one fractional surveyed town; 2,835 acres of hardwood; 10 acres of pine; no hemlock; 16,221 acres of plains partly covered with bushes and scattering trees; 226 acres of swamp covered with cedar, spruce and tamarack.

Sands—Has two whole surveyed towns; 3,280 acres of hardwood, with a small amount of pine and hemlock interspersed; no pine; no hemlock; 39,680 acres of plains partly covered with bushes and scattering trees; no swamp.

Standish—Has two whole surveyed towns; 15,000 acres of hardwood; no pine; 15,000 acres of hemlock; no plains; 15,000 acres of swamp partly covered with small timber and bushes.

Tilden—Has two whole and one fractional surveyed towns; 680 acres of hardwood; 1,760 acres of pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 4,000 acres of swamp partly covered with small timber and bushes.

Turin—Has four surveyed towns; 20,000 acres of hardwood; no pine; 20,000 acres of hemlock; no plains; 51,700 acres of swamp, principally covered with spruce and cedar.

West Branch—Has 12,000 acres of hardwood; no pine; 9,000 acres of hemlock; 540 acres of plains partly covered with bushes and scattering trees; no swamp.

MASON COUNTY

Has thirteen organized townships, consisting of twelve whole and four fractional surveyed towns; 43,746 acres of hardwood; 13,912 acres of pine; 4,360 acres of hemlock; 91,522 acres of plains partly covered with bushes and scattering trees; 33,397 acres of swamp partly covered with small timber and bushes.

AMBER—Has one fractional surveyed town; 1,000 acres of hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 1,040 acres of swamp partly covered with small timber and bushes.

BRANCH—Has two whole surveyed towns; 695 acres of hardwood; 1,400 acres of pine; no hemlock; 35,581 acres of plains covered with second growth timber prevented from growing by forest fires; 1,660 acres of swamp partly covered with small timber and bushes.

CUSTER—Has 500 acres of hardwood; no pine; no hemlock; 10,300 acres of plains partly covered with bushes and scattering trees; 4,000 acres acres of swamp partly covered with small timber and bushes.

EDEN—Has 800 acres of hardwood; 600 acres of pine; 200 acres of hemlock; 10,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

FREE SOIL—Has two whole surveyed towns; 15,025 acres of hardwood; 2,621 acres of pine; 80 acres of hemlock; 12,121 acres of plains partly covered with bushes and scattering trees; 600 acres of swamp partly covered with small timber and bushes.

GRANT—Has one whole and one fractional surveyed town; 3,500 acres of hardwood; no pine; 2,500 acres of hemlock; 14,000 acres of plains partly covered with bushes and scattering trees; 7,000 acres of swamp partly covered with small timber and bushes.

HAMLIN—Has one fractional surveyed town; 1,760 acres of hardwood; 8,631 acres of pine, interspersed with hemlock, hardwood and cedar; 640 acres of hemlock; 6,020 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes.

PERE MARQUETTE—Has four fractional surveyed towns; 2,000 acres of hardwood, with some hemlock interspersed; no pine; no hemlock; no plains; 250 acres of swamp partly covered with small timber and bushes.

RIVERTON—Has 1,585 acres of hardwood, consisting principally of beech, maple and ash, with some hemlock mixed; no pine; no hemlock; no plains; 927 acres of swamp partly covered with small timber and bushes.

SHERIDAN—Has 980 acres of hardwood, consisting principally of beech and maple, with some oak; 640 acres of pine; no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes.

Sherman—Has 5,390 acres of hardwood, consisting of maple, beech, elm, ash and basswood, hemlock is scattered all throughout on sandy ridges; 20 acres of pine; 640 acres of hemlock; no plains; 11,940 acres of swamp partly covered with small timber.

Summit—Has one fractional surveyed town; 1,000 acres of hardwood; no pine; no hemlock; 2,500 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Victory—Has 9,511 acres of hardwood; no pine; 300 acres of hemlock; no plains; 2,880 acres of swamp partly covered with small timber and bushes.

MECOSTA COUNTY

Has sixteen organized townships; 29,869 acres of hardwood; 10 acres of pine; 13,527 acres of hemlock; 66,045 acres of plains partly covered with bushes and scattering trees; 18,567 acres of swamp partly covered with small timber and bushes.

Ætna—Has 300 acres of hardwood; no pine; 5 acres of hemlock; 12,000 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes.

Austin—Has 500 acres of hardwood; no pine; no hemlock; 12,000 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Big Rapids—Has 1,180 acres of hardwood; no pine; no hemlock; 4,302 acres of plains partly covered with bushes and scattering trees; no swamp.

Chippewa—Has 4,180 acres of hardwood, principally beech and maple; no pine; 1,680 acres of hemlock; 7,860 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes; hemlock and hardwood considerably mixed and hard to classify.

Colfax—Has 675 acres of hardwood, principally beech and maple, with hemlock interspersed; no pine; 250 acres of hemlock; no plains; 100 acres of swamp partly covered with small timber and bushes.

Deerfield—Has 1,000 acres of hardwood; 10 acres of pine; 200 acres of hemlock; 100 acres of plains partly covered with bushes and scattering trees; 3,000 acres of swamp partly covered with small timber and bushes.

Fork—Has 3,450 acres of hardwood; no pine; 1,852 acres of hemlock; no plains; 200 acres of swamp covered with black ash and cedar.

Grant—Has 3,650 acres of hardwood; no pine; 1,340 acres of hemlock; 6,400 acres of plains partly covered with bushes and scattering trees; 1,840 acres of swamp partly covered with small timber and bushes; estimated by the supervisor.

Green—Has 5,120 acres of hardwood; no pine; 2,560 acres of hemlock; 5,120 acres of plains partly covered with bushes and scattering trees; 2,560 acres of swamp partly covered with small timber and bushes.

Hinton—Has 2,783 acres of hardwood, consisting of beech, maple and a very little oak; no pine; 340 acres of hemlock; 9,963 acres of plains partly covered with bushes and scattering trees; 3,337 acres of swamp partly covered with small timber and bushes.

Martiny—Has 800 acres of hardwood; no pine; 700 acres of hemlock; no plains; 900 acres of swamp partly covered with small timber and bushes; old pine lands are growing up with poplar and cherry, which, if not injured by fire, will be quite valuable before many years.

Mecosta—Has 4,000 acres of hardwood; no pine; 1,000 acres of hemlock; 6,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Millbrook—Has 400 acres of hardwood; no pine; 600 acres of hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes; some scattering pine mixed among the hemlock.

Morton—Has 75 acres of hardwood; no pine; no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes, mostly pine stump land, timber taken off; timber should be cultivated in this section of Michigan.

Sheridan—Has 900 acres of hardwood; no pine; 3,000 acres of hemlock, somewhat mixed with beech, maple and a little black ash; no plains; 530 acres of swamp, mostly covered with cedar.

Wheatland—Has 856 acres of hardwood, consisting of maple, beech, black ash and elm, with some hemlock interspersed; no pine; no hemlock; 2,300 acres of plains partly covered with bushes and scattering trees; 2,300 acres of swamp partly covered with small timber and bushes.

MENOMINEE COUNTY

Has nine organized townships, consisting of sixteen whole and twenty-one fractional surveyed towns; 50,740 acres of hardwood; 19,890 acres of pine; 65,090 acres of hemlock; 111,260 acres of plains partly covered with bushes and scattering trees; 74,161 acres of swamp partly covered with small timber and bushes. This is less the township of Spalding.

Cedarville—Has four fractional surveyed towns; 20,000 acres of hardwood; 2,000 acres of pine; 30,000 acres of hemlock; 10,000 acres of plains partly covered with bushes and scattering trees; 10,500 acres of swamp partly covered with small timber and bushes.

Holmes—Has five fractional surveyed towns; 4,000 acres of hardwood; 5,000 acres of pine; 1,500 acres of hemlock; 50,000 acres of plains partly covered with bushes and scattering trees; 15,000 acres of swamp partly covered with small timber and bushes.

Ingallston—Has one whole and three fractional surveyed towns; 3,860 acres of hardwood; 200 acres of pine; 3,690 acres of hemlock; 12,000 acres of plains partly covered with bushes and scattering trees; 18,100 acres of swamp partly covered with small timber and bushes.

Mellen—Has one fractional surveyed town; 480 acres of hardwood; 240 acres of pine; 300 acres of hemlock; 8,760 acres of plains partly covered with bushes and scattering trees; 6,761 acres of swamp partly covered with small timber and bushes. Swamps mostly tamarack. Most of the valuable timber has been cut off.

Menominee—Has four fractional surveyed towns; 600 acres of hardwood; no pine; 2,000 acres of hemlock; 20,000 acres of plains partly covered with bushes and scattering trees; 1,600 acres of swamp partly covered with small timber and bushes. Nearly all timber destroyed by forest fires.

Meyer—Has two whole and one fractional surveyed towns; 20,000 acres of hardwood; 500 acres of pine; 25,000 acres of hemlock; no plains; 2,000 acres of swamp partly covered with small timber and bushes. Considerable of the large and better class of hardwood has been cut and is being replaced by a second growth.

Nadeau—Has two whole and one fractional surveyed towns; 1,800 acres of hardwood; 100 acres of pine; 1,600 acres of hemlock; 1,500 acres of plains partly covered with bushes and small trees; 1,400 acres of swamp partly covered with small timber and bushes.

Spalding—Has eight whole and one fracional surveyed towns. There are about two towns that are settled and the other six and one-half are forest lands covered with pine, hemlock, cedar, tamarack and some with scattering trees and bushes on most of which the valuable timber has been removed. It would be impossible for me to give you an estimate of each kind of timber or the number of acres of the different kinds, as it would cost a great deal to look it up.

Stephenson—Has three whole and five fractional surveyed towns; no hardwood; 11,850 acres of pine; 1,000 acres of hemlock; 9,000 acres of plains partly covered with bushes and scattering trees; 18,800 acres of swamp partly covered with small timber and bushes.

MIDLAND COUNTY

Has sixteen organized townships; 42,263 acres of hardwood; no pine; 720 acres of hemlock; 53,541 acres of plains partly covered with bushes and scattering trees; 52,483 acres of swamp partly covered with small timber and bushes.

Edenville—Has 1,800 acres of hardwood; no pine; no hemlock; 13,000 acres of plains partly covered with bushes and scattering trees; 360 acres of swamp partly covered with small timber and bushes.

Geneva—Has 1,400 acres of hardwood; no pine; no hemlock; no plains; 16,000 acres of swamp partly covered with small timber and bushes.

Greendale—Has no hardwood; no pine; no hemlock; no plains; 100 acres of swamp partly covered with small timber and bushes. This township was at one time all pine and hemlock forest but it is now lumbered off and nothing but stump land remains.*

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* This stump land should have been classified as "plains."

Homer—Has 800 acres of hardwood; no pine; no hemlock; 10,539 acres of plains partly covered with bushes and scattering trees; 1,200 acres of swamp partly covered with small timber and bushes.

Hope—Has 2,100 acres of hardwood; no pine; no hemlock; no plains; 20 acres of swamp partly covered with small timber and bushes.

Ingersoll—Has no hardwood; no pine; no hemlock; 1,820 acres of plains partly covered with bushes and scattering trees; 1,660 acres of swamp partly covered with small timber and bushes. All timber has been removed.

Jasper—Has 2,804 acres of hardwood; no pine; no hemlock; 6,000 acres of plains partly covered with bushes and scattering trees; 6,000 acres of swamp partly covered with small timber and bushes. The timber is valuable hardwood interspersed in some instances with hemlock and pine, with but very little of either.

Jerome—Has 1,000 acres of hardwood; no pine; no hemlock; no plains; 2,000 acres of swamp partly covered with small timber and bushes.

Larkin—Has 3,000 acres of hardwood; no pine; no hemlock; 12,000 of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Lee—Has 10,849 acres of hardwood; no pine; no hemlock; no plains; 1,000 acres of swamp partly covered with small timber and bushes. What valuable timber has not been removed has been nearly all destroyed by forest fires.

Lincoln—Has 410 acres of hardwood; no pine; no hemlock; 6,500 acres of plains partly covered with bushes and scattering trees; 7,063 acres of swamp partly covered with small timber and bushes.

Midland—Has no hardwood; no pine; no hemlock; 682 acres of plains covered with scattering ash, elm and oak; 8,800 acres of swamp covered with a scrubby growth of poplar and willow.

Mills—Has 3,100 acres of hardwood, consisting principally of elm, soft maple and ash; no pine; 120 acres of hemlock; no plains; 5,000 acres of swamp partly covered with small timber and bushes.

Mt. Haley—Has 2,000 acres of hardwood; no pine; no hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; 600 acres of swamp partly covered with small timber and bushes. Valuable timber has all been cut.

Porter—Has 8,000 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes; Nothing but small and second growth timber remain in township. What large timber has not been lumbered off has been destroyed by fire.

Warren—Has 5,000 acres of hardwood; no pine; 600 acres of hemlock; no plains; 100 acres of swamp partly covered with small timber and bushes. Hardwood land not heavily timbered.

MISSAUKEE COUNTY

Has thirteen organized townships, consisting of sixteen whole surveyed towns; has 91,294 acres of hardwood; 10,912 acres of pine; 21,280 acres of hemlock; 112,555 acres of plains partly covered with bushes and scattering trees; 46,245 acres of swamp partly covered with small timber and bushes.

Ætna—Has 15,000 acres of hardwood; no pine; 1,000 acres of hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes. The valuable timber in this township is nearly all gone.

Bloomfield—Has 7,135 acres of hardwood; 40 acres of pine; no hemlock; 12,400 acres of plains partly covered with bushes and scattering trees; 1,600 acres of swamp partly covered with small timber and bushes. Part of the standing hardwood has had the best timber cut off or destroyed by fire.

Butterfield—Has 1,200 acres of hardwood; no pine; no hemlock; 9,000 acres of plains partly covered with bushes and scattering trees; 9,000 acres of swamp partly covered with small timber and bushes. What valuable timber has not been cut has been nearly all destroyed by fire.

Caldwell—Has 3,520 acres of hardwood; 1,507 acres of pine; 600 acres of hemlock; 10,544 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes. Saw timber has been removed from part of the hardwood, hemlock has been injured by fire.

Clam Union—Has two whole surveyed towns; 3,440 acres of hardwood, consisting principally of maple and beech with some elm and basswood, a little hemlock interspersed; no pine; no hemlock; 24,331 acres of plains partly covered with bushes and scattering trees; 7,450 acres of swamp partly covered with small timber and bushes.

Forest—Has 4,040 acres of hardwood, consisting of maple, beech, basswood, birch and elm; 150 acres of pine; 320 acres of hemlock; 4,300 acres of plains partly covered with bushes and scattering trees; 700 acres of swamp partly covered with small cedar, tamarack and ash.

Lake—Has one surveyed township; 5,000 acres of hardwood; 600 acres of pine; no hemlock standing by itself; 3,000 acres of plains covered with bushes and small timber, liable to be destroyed as leaves and grass accumulate. It also has about 1,000 acres of swamp covered with cedar, tamarack and bushes. This estimate was made by County Surveyor Richardson, the supervisor failing to respond to any communication sent him.

Norwich—Has two whole surveyed towns; 12,000 acres of hardwood; 8,000 acres of pine; 2,000 acres of hemlock; 15,000 acres of plains partly covered with bushes and scattering trees; 7,000 acres of swamp partly covered with small timber and bushes. The hemlock in this township is nearly worthless, and part of the pine has been damaged by fire.

Pioneer—Has 13,379 acres of hardwood; 615 acres of pine; no hemlock; no plains; 150 acres of swamp partly covered with small timber and bushes.

Reeder—Has 2,000 acres of hardwood; no pine; 2,000 acres of hemlock; 14,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp covered with a good quality of cedar. The timber in this township has been severely damaged by fire.

Richland—Has 6,680 acres of hardwood; no pine; 5,600 acres of hemlock; 4,180 acres of plains partly covered with bushes and scattering trees; 125 acres of swamp partly covered with small timber and bushes. The hardwood in this township is in a good condition, but the hemlock has been greatly injured by forest fires.

Riverside—Has one surveyed township; 12,400 acres of hardwood; no pine; 1,800 acres of hemlock; 3,000 acres of plains covered only with bushes and worthless timber; 2,000 acres of swamp covered with cedar tamarack and bushes. The hardwood has some ash and hemlock interspersed, the principal timber being maple, beech and elm. This estimate was made by County Surveyor Richardson, the supervisor failing to respond to any communication sent him.

West Branch—Has two whole surveyed towns; 5,500 acres of hardwood; no pine; 7,960 acres of hemlock; 12,800 acres of plains partly covered with bushes and scattering trees; 14,620 acres of swamp partly covered with small timber and bushes. Most of the first-class hardwood and cedar have been cut. Part of hemlock burned over in 1895.

MONROE COUNTY

Has fifteen organized townships, consisting of 13 whole and four fractional surveyed towns; 31,316 acres of hardwood; no pine; no hemlock; 5,500 acres of plains partly covered with bushes and scattering trees; 8,265 acres of swamp partly covered with small timber and bushes.

Ash—Has 3,245 acres of hardwood; no pine; no hemlock; no plains; 105 acres of swamp partly covered with small timber and bushes.

Bedford—Has 4,000 acres of hardwood; no pine; no hemlock; no plains; no swamp. A greater part of the standing timber is oak openings, the balance consists of oak, hickory and elm.

Berlin—Has two fractional surveyed towns; 1,500 acres of hardwood; no pine; no hemlock; no plains; 100 acres of swamp partly covered with small timber and bushes. Timber is dying rapidly. It consists of oak, beech, maple, hickory, elm, ash and basswood.

Dundee—Has one whole and part of another surveyed town; 3,000 acres of hardwood, no pine; no hemlock; no plains; 2,000 acres of swamp partly covered with small timber and bushes.

Erie—Has one fractional surveyed town; 250 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Exeter—Has 1,616 acres of hardwood; no pine; no hemlock; 2,500 acres of plains partly covered with bushes and scattering trees; 340 acres of swamp partly covered with small timber and bushes.

Frenchtown—Has one whole and one fractional surveyed town; 3,000 acres of hardwood; no pine; no hemlock; no plains; 2,000 acres of swamp partly covered with small timber and bushes. Standing timber consists of elm, ash, oak, hickory, poplar and willow.

Ida—Has 5,170 acres of hardwood; no pine; no hemlock; no plains; no swamp. Two-thirds of timber reported consists of oak openings; balance consists of oak, elm, hickory, ash, basswood, maple and black walnut. Greater part of valuable timber has been removed.

La Salle—Has a part of two surveyed towns; 800 acres of hardwood; no pine; no hemlock; no plains; 150 acres of swamp partly covered with small timber and bushes.

London—Has 450 acres of hardwood; no pine; no hemlock; 2,500 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes. Valuable timber nearly all gone.

Milan—Has 2,000 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Monroe—Is a part of three surveyed towns; 700 acres of hardwood; no pine; no hemlock; no plains; 1,500 acres of swamp partly covered with small timber and bushes.

Raisinville—Is a part of two surveyed towns; 1,500 acres of hardwood; no pine; no hemlock; 500 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Summerfield—Has 1,535 acres of hardwood; no pine; no hemlock; no plains; 370 acres of swamp partly covered with small timber and bushes.

Whiteford—Has one whole and part of another surveyed town; 2,550 acres of hardwood; no pine; no hemlock; no plains; no swamp.

MONTCALM COUNTY

Has twenty organized towns; 20,434 acres of hardwood; 120 acres of pine; 750 acres of hemlock; 32,955 acres of plains partly covered with bushes and scattering trees; 20,273 acres of swamp partly covered with small timber and bushes.

Belvidere—Has 820 acres of hardwood; no pine; 160 acres of hemlock; no plains; 360 acres of swamp partly covered with small timber and bushes. Valuable timber nearly all gone; what has not been lumbered, has been destroyed by fire and wind.

Bloomer—Has 2,750 acres of hardwood; no pine; no hemlock; no plains; 1,500 acres of swamp partly covered with small timber and bushes.

Bushnell—Has 3,750 acres of hardwood; no pine; no hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; 1,250 acres of swamp partly covered with tamarack, small timber and bushes.

Cato—Has 800 acres of hardwood; no pine; 200 acres of hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes.

Crystal—Has 3,000 acres of hardwood; no pine; no hemlock; 500 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Day—Has 108 acres of hardwood, consisting of beech and maple and some scattering oak and elm; no pine; no hemlock; no plains; 361 acres of swamp partly covered with elm and black ash.

Douglass—Has 1,735 acres of hardwood; no pine; no hemlock; no plains; 1,749 acres of swamp partly covered with small timber and bushes.

Eureka—Has 261 acres of hardwood; no pine; no hemlock; 1,255 acres of plains partly covered with bushes and scattering trees; 898 acres of swamp partly covered with small timber and bushes.

Evergreen—Has no hardwood; no pine; no hemlock; 1,800 acres of plains parly covered with bushes and scattering hardwood timber of a mixed quality; 700 acres of swamp covered with black ash, tamarack and cedar.

Fair Plain—Has 1,200 acres of hardwood; 80 acres of pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes.

Ferris—Has 1,425 acres of hardwood; no pine; no hemlock; 1,200 acres of plains partly covered with bushes and scattering trees; 1,270 acres of swamp partly covered with small timber and bushes.

Home—Has 60 acres of hardwood; no pine; 300 acres of hemlock interspersed with other timber; 1,300 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Maple Valley—Has 950 acres of hardwood; no pine; no hemlock; no plains; 540 acres of swamp partly covered with small timber and bushes.

Montcalm—Has 100 acres of hardwood; 40 acres of pine; no hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Pierson—Has 1,485 acres of hardwood; no pine; no hemlock; no plains; 445 acres of swamp covered with black ash, elm and tamarack. Valuable hardwood has been removed, what remains consists of beech, oak and maple.

Pine Has 200 acres of hardwood; no pine; no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes.

Reynolds—Has 160 acres of hardwood, consisting of beech and maple; no pine; no hemlock; 13,800 acres of plains partly covered with bushes and scattering trees; 320 acres of swamp covered with black ash, poplar, ironwood and tamarack.

Richland—Has 730 acres of hardwood; no pine; 90 acres of hemlock; 3,100 acres of plains partly covered with bushes and scattering trees; 180 acres of swamp partly covered with small timber and bushes. All valuable timber has been cut.

Sidney—Has 500 acres of hardwood; no pine; no hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp partly covered with small timber and bushes.

Winfield—Has 400 acres of hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes. Nearly all the hardwood has been sorted over.

MONTMORENCY COUNTY

Has seven organized townships, consisting of sixteen whole surveyed towns; 58,853 acres of hardwood; 12,780 acres of pine; 15,330 acres of hemlock; 166,696 acres of plains partly covered with bushes and scattering trees; 41,540 acres of swamp partly covered with small timber and bushes.

Albert—Has two whole surveyed towns; 900 acres of hardwood; 5,000 acres of pine; no hemlock; 30,000 acres of plains partly covered with bushes and scattering trees; 7,000 acres of swamp partly covered with small timber and bushes. Hemlock interspersed among the hardwood. All good timber cut years ago.

Briley—Has part of two surveyed towns; 16,300 acres of hardwood; 3,000 acres of pine; 1,650 acres of hemlock; 7,500 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Hillman—Has three whole surveyed towns; 2,940 acres of hardwood; 1,280 acres of pine; 1,920 acres of hemlock; 23,040 acres of plains partly covered with bushes and scattering trees; 11,540 acres of swamp partly covered with small timber and bushes.

Montmorency—Has four whole and part of another surveyed town; 520 acres of hardwood; 960 acres of pine; 960 acres of hemlock; 69,120 acres of plains covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes. Hemlock interspersed among the maple and beech.

Rust—Has three surveyed towns; 15,000 acres of hardwood, consisting chiefly of maple and beech; no pine; 5,000 acres of hemlock; 30,000 acres of plains partly covered with bushes and scattering trees; 11,000 acres of swamp formerly partly covered with small timber and bushes but now nearly all destroyed by fire.

Vienna—Has a part of two surveyed towns; 15,600 acres of hardwood, consisting of maple, beech, elm, basswood and ash; 1,040 acres of pine; 5,200 acres of hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes. Hemlock more or less interspersed among the hardwood.

Wheatfield—Has one whole and part of another surveyed town; 7,593 acres of hardwood; 1,500 acres of pine; 600 acres of hemlock; 5,036 acres of plains partly covered with bushes and scattering trees; 8,000 acres of swamp partly covered with small timber and bushes.

MUSKEGON COUNTY

Has seventeen organized townships consisting of thirteen whole and four fractional surveyed towns. Without the township of Fruitport it has 22,405 acres of hardwood; 355 acres of pine; 470 acres of hemlock; 91,690 acres of plains partly covered with bushes and scattering trees; 21,220 acres of swamp partly covered with small timber and bushes.

Blue Lake—Has 2,000 acres of hardwood; 120 acres of pine; no hemlock; 15,000 acres of plains partly covered with bushes and scattering trees; 3,000 acres of swamp partly covered with small timber and bushes. The hardwood in this township consists of lands upon which pine formerly stood but has now been removed, leaving the oak standing. Plains covered with oak bushes.

Casinovia—Has 2,115 acres of hardwood; no pine; no hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Cedar Creek—Has 3,500 acres of hardwood; no pine; no hemlock; 11,210 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes. The greater part of the valuable timber has been removed.

Dalton—Has 4,866 acres of hardwood, consisting principally of thrifty, dense "oak openings," with some ash, elm and pepperage; 40 acres of pine; no hemlock; 3,840 acres of plains sparsely covered with jack pine; no swamp.

Eggleston—Has 2,000 acres of hardwood; no pine; no hemlock; 12,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Fruitland—Has 190 acres of hardwood, with pine and hemlock interspersed; 55 acres of pine; 70 acres of hemlock; 4,600 acres of plains partly covered with bushes and scattering trees; 450 acres of swamp partly covered with small timber and bushes.

Fruitport—Repeated requests to the supervisor of this township failed to elicit any reply. There is but little timber in the township.

Holton—Has 400 acres of hardwood; no pine; no hemlock; 14,928 acres of plains partly covered with bushes and scattering trees; no swamp.

Laketon—Has one fractional surveyed town; 566 acres of hardwood; consisting of oak, beech, ash, elm and maple; no pine; no hemlock; 728 acres of plains partly covered with bushes and scattering trees; no swamp. The timber in this township has been greatly injured by forest fires. All pine and hemlock saw timber was lumbered off years ago.

Montague—Has 250 acres of hardwood; no pine; no hemlock; 4,800 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes. The pine and hemlock in this township is nearly all gone.

Moorland—Has 2,620 acres of hardwood; no pine; no hemlock; 2,800 acres of plains partly covered with bushes and scattering trees; 3,100 acres of swamp partly covered with small timber and bushes. Forest fires have destroyed nearly all the timber in this township.

Muskegon—Has 2,000 acres of hardwood; a large part of which consists of oak openings covered with oak grubs; 140 acres of pine; 300 acres of hemlock; 3,400 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp covered with beech, birch, maple, ash, etc.

Norton—Has one fractional surveyed town; 288 acres of hardwood; no pine; no hemlock; 6,724 acres of plains partly covered with bushes and scattering trees; 510 acres of swamp partly covered with small timber and bushes. All the valuable timber in this township has been removed.

Ravenna—Has 1,240 acres of hardwood; no pine; 100 acres of hemlock; 1,800 acres of plains partly covered with bushes and scattering trees; no swamp timber. There is some swamp in this township with no timber or bushes on it.

Sullivan—Has one fractional surveyed town; 80 acres of hardwood; no pine; no hemlock; 2,560 acres of plains, growing up with oak grubs; 2,560 acres of swamp covered with tamarack and black ash. The timber in this township was formerly hemlock which is now all gone.

Whitehall—Has one fractional surveyed town; no hardwood; no pine; no hemlock; 1,600 acres of plains partly covered with bushes and scattering trees; 700 acres of swamp partly covered with small timber and bushes. All the valuable timber in this township is gone.

White River—Has 290 acres of hardwood; no pine; no hemlock; 3,700 acres of plains, formerly covered with pine but now growing up with oak grubs; 200 acres of swamp partly covered with small timber and bushes.

NEWAYGO COUNTY

Has twenty-two organized townships, consisting of twenty-four whole surveyed towns; 37,265 acres of hardwood; 2,665 acres of pine; 2,221 acres of hemlock; 194,592 acres of plains partly covered with bushes and scattering trees; 34,942 acres of swamp partly covered with small timber and bushes.

Ashland—Has 2,000 acres of hardwood; no pine; no hemlock; 6,400 acres of plains partly covered with bushes and scattering trees; 900 acres of swamp covered with tamarack, elm, black ash, etc.

Barton—Has 1,400 acres of hardwood; no pine; 100 acres of hemlock; 10,860 acres of plains partly covered with bushes and scattering trees; 1,600 acres of swamp partly covered with small timber and bushes.

BEAVER—Has one whole and part of another town; 4,000 acres of hardwood; 1,580 acres of pine; 320 acres of hemlock; 12,000 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes.

BIG PRAIRIE—Has 1,920 acres of hardwood; 120 acres of pine; no hemlock; 1,200 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes.

BRIDGETON—Has 1,705 acres of hardwood, consisting principally of maple and beech; no pine; 741 acres of hemlock; 15,180 acres of plains partly covered with bushes and scattering trees; 6 acres of swamp partly covered with small timber and bushes.

BROOKS—Has no hardwood; no pine; no hemlock; 16,200 acres of plains covered with scrub oak; no swamp.

CROTON—Has no hardwood; no pine; no hemlock; no plains; no swamp; Nearly all of the township that is not improved farms is pine stump land.

DAYTON—Has 2,864 acres of hardwood; 5 acres of pine; 40 acres of hemlock; 40 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes.

DENVER—Has 620 acres of hardwood; no pine; 50 acres of hemlock; no plains; 600 acres of swamp partly covered with small timber and bushes.

ENSLEY—Has no hardwood; no pine; no hemlock; 900 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

EVERETT—Has 15,200 acres of hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

GARFIELD—Has 728 acres of hardwood; no pine; no hemlock; 2,138 acres of plains partly covered with bushes and scattering trees; 126 acres of swamp partly covered with small timber and bushes.

GOODWELL—Has 640 acres of hardwood; no pine; 360 acres of hemlock; 17,145 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp partly covered with small timber and bushes. About one-fourth of plains covered with oak grubs.

GRANT—Has 2,000 acres of hardwood; 240 acres of pine and hemlock mixed; 5,120 acres of plains partly covered with bushes and scattering trees; 8,000 acres of swamp partly covered with small timber and bushes.

HOME—Has one whole and part of another town; 165 acres of wood; 320 acres of pine; 45 acres of hemlock; 22,246 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes. Nearly all valuable timber has been removed.

LINCOLN—Has 8 acres of hardwood; no pine; no hemlock; 20,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes. Timber has nearly all been destroyed by fire.

Monroe—Has one whole and part of another town; 500 acres of hardwood; no pine; 40 acres of hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; 10,000 acres of swamp partly covered with small timber and bushes. Swamp-land has a growth of small timber, such as tamarack, ash, elm and cedar, which will be large enough to lumber in a few years.

Norwich—Has 865 acres of hardwood; 640 acres of pine; no hemlock; 19,019 acres of plains partly covered with bushes and scattering trees; 260 acres of swamp partly covered with small timber and bushes.

Sheridan—Has 950 acres of hardwood; no pine; 25 acres of hemlock; 2,700 acres of plains partly covered with bushes and scattering trees; 750 acres of swamp partly covered with small timber and bushes.

Sherman—Has 700 acres of hardwood; no pine; no hemlock; 17,640 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes.

Troy—Has one whole and part of another town; a very little hardwood; no pine; a small amount of scattering hemlock; 1,920 acres of plains partly covered with bushes and scattering trees; no swamp.

Wilcox—Has 1,000 acres of hardwood; no pine; 500 acres of hemlock; 17,884 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes.

OAKLAND COUNTY

Has twenty-five organized townships; 56,544 acres of hardwood; 20 acres of pine; no hemlock; 11,289 acres of plains partly covered with bushes and scattering tress; 51,325 acres of swamp partly covered with small timber and bushes.

Addison—Has 2,520 acres of hardwood; 20 acres of pine; no hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 3,500 acres of swamp partly covered with small timber and bushes. All valuable timber has been removed.

Avon—Has 4,353 acres of hardwood; no pine; no hemlock; 814 acres of plains partly covered with small timber and bushes; 1,000 acres of swamp partly covered with small timber and bushes; the hardwood timber is all second growth oak.

Bloomfield—Has 1,500 acres of hardwood; no pine; no hemlock; no plains; 250 acres of swamp partly covered with small timber and bushes.

Brandon—Has 3,500 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes.

Commerce—Has 1,225 acres of hardwood; no pine; no hemlock; no plains; 750 acres of swamp, principally covered with tamarack. Hardwood has been largely cut, what remains is mostly second growth oak.

FARMINGTON—Has 2,614 acres of hardwood; no pine; no hemlock; no plains; 248 acres of swamp partly covered with small timber and bushes. Timber nearly all oak, beech and maple; a few basswood and elm.

GROVELAND—Has 2,880 acres of hardwood; no pine; no hemlock; no plains; 2,700 acres of swamp partly covered with small timber and bushes.

HIGHLAND—Has 1,636 acres of hardwood, consisting chiefly of scrub oak and hickory; no pine; no hemlock; no plains; 5,100 acres of swamp partly covered with small timber and bushes.

HOLLY—Has 3,057 acres of hardwood; no pine; no hemlock; no plains; 5,600 acres of swamp partly covered with small timber and bushes.

INDEPENDENCE—Has 400 acres of hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 3,000 acres of swamp partly covered with small timber and bushes.

LYON—Has 2,600 acres of hardwood, consisting chiefly of oak, beech, maple, elm and ash; no pine; no hemlock; 975 acres of plains partly covered with bushes and scattering trees; 2,635 acres of swamp partly covered with tamarack.

MILFORD—Has 1,765 acres of hardwood; no pine; no hemlock; no plains; 3,875 acres of swamp partly covered with small timber and bushes. Timber principally oak, and excepting about 200 acres is all second growth.

NOVI—Has 4,000 acres of hardwood, consisting of oak, beech, maple, hickory, elm and ash; no pine; no hemlock; no plains; 2,867 acres of swamp partly covered with small timber and bushes.

OAKLAND—Has 1,836 acres of hardwood; no pine; no hemlock; no plains; 5,000 acres of swamp partly covered with small timber and bushes.

ORION—Has 1,540 acres of hardwood, consisting of oak, hickory, and a small amount of ash, elm, beech and maple; no pine of value; no hemlock; no plains; 2,000 acres of swamp, covered more or less with tamarack and cedar, with some small pine interspersed.

OXFORD—Has 1,650 acres of hardwood; a small amount of pine; no hemlock; 400 acres of plains partly covered with bushes and scattering trees; 1,200 acres of swamp partly covered with small timber and bushes.

PONTIAC—Has 2,000 acres of hardwood; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes.

ROSE—Has 4,000 acres of hardwood, a good share of which is second growth; no pine; no hemlock; no plains; 3,500 acres of swamp partly covered with tamarack and bushes.

ROYAL OAK—Has 2,500 acres of hardwood; no pine; no hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes. Not much first-class timber in this township, what there is consists of oak, elm, maple and ash.

SOUTHFIELD—Has 2,355 acres of hardwood, consisting of ash, basswood, beech, elm, hickory, maple, oak and a little whitewood; no pine; no hemlock; no plains; no swamp.

Springfield—Has 400 acres of hardwood; no pine; no hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Troy—Has 1,500 acres of hardwood, consisting of beech, maple, oak, elm, basswood, ash, whitewood, black walnut, etc.; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Waterford—Has 505 acres of hardwood; no pine; no hemlock; 100 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes. Most of the timber is second growth.

West Bloomfield—Has 3,750 acres of hardwood; no pine; no hemlock; no plains; 1,500 acres of swamp partly covered with small timber and bushes.

White Lake—Has 2,458 acres of hardwood; no pine; no hemlock; no plains; 3,500 acres of swamp partly covered with small timber and bushes.

OCEANA COUNTY.

Has sixteen organized townships, consisting of twelve whole and six fractional surveyed towns; 46,518 acres of hardwood; 73 acres of pine; 6,437 acres of hemlock; 73,997 acres of plains partly covered with bushes and scattering trees; 13,790 acres of swamp partly covered with small timber and bushes.

Benona—Has two fractional surveyed towns; 5,000 acres of hardwood; 13 acres of pine; 1,800 acres of hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; no swamp. Hardwood consists of beech, maple, elm and basswood. Some pine interspersed among the hemlock.

Claybanks—Has one fractional surveyed town; 4,000 acres of hardwood; no pine; 100 acres of hemlock; 200 acres of plains partly covered with bushes and scattering trees; 80 acres of swamp partly covered with small timber and bushes.

Colfax—Has 2,800 acres of hardwood, nearly all second growth; no pine; no hemlock; no plains; 1,500 acres of swamp partly covered with small timber and bushes.

Crystal—Has 1,590 acres of hardwood, consisting principally of beech and maple; no pine; no hemlock; 11,840 acres of plains mostly covered with oak grubs; 2,640 acres of swamp partly covered with small timber and bushes.

Eldridge—Has 4,240 acres of hardwood; no pine; 600 acres of hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes.

Ferry—Has 6,200 acres of hardwood; no pine; no hemlock; 8,621 acres of plains partly covered with bushes and scattering trees; 800 acres of swamp partly covered with small timber and bushes.

Golden—Has two fractional surveyed towns; 1,620 acres of hardwood; no pine; no hemlock; 9,156 acres of plains partly covered with bushes and scattering trees; 395 acres of swamp partly covered with small timber and bushes.

Grant—Has 490 acres of hardwood; 40 acres of pine; no hemlock; 5,740 acres of plains partly covered with bushes and scattering trees; 900 acres of swamp partly covered with small timber and bushes.

Greenwood—Has 772 acres of hardwood; no pine; no hemlock; 7,600 acres of plains partly covered with bushes and scattering trees; no swamp.

Hart—Has 3,510 acres of hardwood, consisting chiefly of maple, elm and beech with some hemlock interspersed; no pine; 160 acres of hemlock; 3,600 acres of plains partly covered with bushes and scattering trees; 80 acres of swamp partly covered with small timber and bushes.

Leavitt—Has 4,220 acres of hardwood; no pine; 2,950 acres of hemlock; 1,100 acres of plains partly covered with bushes and scattering trees; 3,220 acres of swamp partly covered with cedar and black ash.

Newfield—Has 1,316 acres of hardwood; 20 acres of pine; 667 acres of hemlock; no plains; 650 acres of swamp partly covered with small timber and bushes. Timber greatly injured by forest fires.

Otto—Has 1,500 acres of hardwood; no pine; no hemlock, except as interspersed with hardwood; 10,740 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes. Timber consists of "oak openings" covered with oak grubs; also beech, maple, basswood, elm and some hemlock.

Pentwater—Has one fractional surveyed town; no hardwood; no pine; no hemlock; 300 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Shelby—Has 2,260 acres of hardwood, with some hemlock interspersed; no pine; no hemlock, except as interspersed with hardwood; 6,600 acres of plains partly covered with bushes and scattering trees; 125 acres of swamp partly covered with small timber and bushes.

Weare—Has 7,000 acres of hardwood; no pine; 160 acres of hemlock; 5,500 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes. Timber consists chiefly of maple, elm, beech and basswood, interspersed with scattering hemlock.

OGEMAW COUNTY.

Has fourteen organized townships, consisting of sixteen whole towns; 54,930 acres of hardwood; 3,750 acres of pine; 6,105 acres of hemlock; 93,182 acres of plains partly covered with bushes and scattering trees; 18,170 acres of swamp partly covered with small timber and bushes.

Beaver Lake—Has 340 acres of hardwood; no pine; no hemlock; 1,245 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes. Timber consists of jack pine, poplar, oak and hard maple.

Churchill—Has 1,900 acres of hardwood; no pine; 600 acres of hemlock; 640 acres of plains partly covered with bushes and scattering trees; 700 acres of swamp partly covered with small timber and bushes.

Cumming—Has 6,000 acres of hardwood, with hemlock interspersed; no pine; no hemlock, except as interspersed with hardwood; 3,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Edwards—Has 2,000 acres of hardwood; no pine; 2,000 acres of hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; 3,000 acres of swamp partly covered with small timber and bushes; hemlock and hardwood mixed throughout.

Foster—Has one whole and part of another surveyed town; 100 acres of hardwood; 200 acres of pine; no hemlock; 28,897 acres of plains partly covered with bushes and scattering trees; 1,130 acres of swamp partly covered with small timber and bushes.

Goodar—Has 3,790 acres of hardwood; no pine; 505 acres of hemlock; no plains; 3,720 acres of swamp, more or less covered with cedar and hemlock; hemlock and hardwood mixed throughout. Valuable timber has all been removed or destroyed by fires.

Hill—Has 7,800 acres of hardwood, with hemlock interspersed; no pine; no hemlock; no plains; no swamp; fires have destroyed nearly all timber that has not been lumbered off.

Horton—Has 350 acres of hardwood; no pine; no hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 1,600 acres of swamp partly covered with small timber and bushes.

Klacking—Has 3,800 acres of hardwood, with hemlock interspersed; 1,950 acres of pine; no hemlock, except as interspersed with hardwood; 15,000 acres of plains partly covered with bushes and scattering trees; 320 acres of swamp partly covered with small timber and bushes; pine is of second growth. Part of the land formerly covered with pine is now grown up to poplar and jack pine.

Logan—Has 250 acres of hardwood; no pine; 1,000 acres of hemlock; no plains; considerable swamp covered with tamarack. Fire has injured hardwood and hemlock greatly.

Mills—Has 160 acres of hardwood; 400 acres of pine; no hemlock; 11,000 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Richland—Has 2,000 acres of hardwood; 1,000 acres of pine; no hemlock; no plains; 1,000 acres of swamp partly covered with small timber and bushes.

Rose—Has one whole and part of another surveyed town; 6,400 acres of hardwood; 200 acres of pine; 2,000 acres of hemlock; 9,400 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

West Branch—Has two whole surveyed towns; 20,040 acres of hardwood with hemlock interspersed; no pine; no hemlock, except as interspersed with hardwood; 17,000 acres of plains; partly covered with bushes and scattering trees; 3,000 acres of swamp partly covered with small timber and bushes.

ONTONAGON COUNTY

Has seven organized townships, consisting of thirty-three whole and eight fractional surveyed towns; 205;500 acres of hardwood; 63,280 acres of pine; 207,160 acres of hemlock; 17,200 acres of plains partly covered with bushes and scattering trees; 32,760 acres of swamp partly covered with small timber and bushes.

Bohemia—Has three whole and one fractional surveyed towns; 40,000 acres of hardwood, consisting of maple and birch, with pine interspersed; 2,000 acres of pine; 20,000 acres of hemlock, with pine interspersed; no plains; 2,000 acres of swamp partly covered with small timber and bushes.

Carp Lake—Has four whole and four fractional surveyed towns; about 140,000 acres, covered more or less with various kinds of timber, mixed; some hardwood, some hemlock, some plains, with some pine interspersed; 60 acres of swamp partly covered with small timber and bushes.

Greenland—Has 10,000 acres of hardwood; 2,000 acres of pine; 12,400 acres of plains partly covered with bushes and scattering trees; no swamp. Hard and soft woods are mixed in about equal proportion in many parts of the township. Timber land estimates were made by B. F. Chynoweth, county surveyor, and are believed to be as accurate as it is possible to make an estimate.

Interior—Has five whole surveyed towns; 10,500 acres of hardwood, with hemlock interspersed; 2,880 acres of pine; 67,760 acres of hemlock; no plains; 23,350 acres of swamp partly covered with small timber and bushes.

McMillan—Has six whole surveyed towns; 10,000 acres of hardwood; 20,000 acres of pine; 10,000 acres of hemlock; no plains; no swamp. Timber is hemlock, birch, hard maple, basswood, elm and pine.

Ontonagon—Has nine whole and five fractional surveyed towns; 115,000 acres of hardwood; 11,400 acres of pine; 82,000 acres of hemlock; 14,500 acres of plains partly covered with bushes and scattering trees; 6,800 acres of swamp partly covered with small timber and bushes. This township has a great extent of unexplored territory. Timber land estimate is made by the county surveyor.

Rockland—Has two whole and part of three other surveyed towns; 20,000 acres of hardwood; 25,000 acres of pine; 15,000 acres of hemlock; no plains; 550 acres of swamp partly covered with small timber and bushes. The timber is maple, basswood, spruce, birch, cedar, balsam and hemlock interspersed sparingly with soft maple, poplar, ironwood, tamarack, red oak, elm and black ash.

OSCEOLA COUNTY

Has sixteen organized townships; 56,611 acres of hardwood; 1,120 acres of pine; 12,158 acres of hemlock; 56,280 acres of plains partly covered with bushes and scattering trees; 20,544 acres of swamp partly covered with small timber and bushes.

Burdell—Has 1,960 acres of hardwood; 240 acres of pine; 1,460 acres of hemlock; no plains; 4,010 acres of swamp partly covered with small timber and bushes.

Cedar—Has 2,000 acres of hardwood; no pine; 1,500 acres of hemlock; 15,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Evart—Has 2,886 acres of hardwood; no pine; 748 acres of hemlock; 5,110 acres of plains partly covered with bushes and scattering trees; 224 acres of swamp partly covered with small timber and bushes.

Hartwick—Has 8,165 acres of hardwood; 40 acres of pine; no hemlock; no plains; 1,260 acres of swamp partly covered with small timber and bushes. Timber is beech, maple, elm, basswood, birch and hemlock.

Hersey—Has 900 acres of hardwood; no pine; 200 acres of hemlock; 4,500 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes. This township was once heavily timbered.

Highland—Has 10,040 acres of hardwood, consisting of beech, maple and rock elm, mixed with hemlock, ash and cedar; no pine; 3,320 acres of hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes.

Le Roy—Has 6,840 acres of hardwood; 300 acres of pine; 1,520 acres of hemlock; no plains; 2,660 acres of swamp partly covered with small timber and bushes.

Lincoln—Has 3,000 acres of hardwood; 500 acres of pine; 1,000 acres of hemlock; no plains; 500 acres of swamp covered with tamarack and cedar.

Marion—Has 5,000 acres of hardwood; 40 acres of pine; 1,600 acres of hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes.

Middle Branch—Has 2,050 acres of hardwood; no pine; 210 acres of hemlock; 5,020 acres of plains partly covered with bushes and scattering trees; 280 acres of swamp partly covered with small timber and bushes.

Orient—Has 1,600 acres of hardwood; no pine; 500 acres of hemlock; no plains; 4,000 acres of swamp partly covered with small timber and bushes.

Osceola—Has 1,380 acres of hardwood; no pine; no hemlock; 13,550 acres of plains partly covered with bushes and scattering trees; 1,560 acres of swamp partly covered with small timber and bushes.

Richmond—Has 2,390 acres of hardwood; some pine and hemlock, interspersed among the hardwood; 1,100 acres of plains partly covered with bushes and scattering trees; 1,050 acres of swamp partly covered with small timber and bushes.

Rose Lake—Has 3,400 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Sherman—Has 3,000 acres of hardwood, consisting of maple, elm and basswood; no pine; 100 acres of hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes.

Sylvan—Has 2,000 acres of hardwood; no pine; no hemlock; 10,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

OSCODA COUNTY

Has eight organized townships, consisting of sixteen whole surveyed towns; 45,660 acres of hardwood; 21,706 acres of pine; 4,000 acres of hemlock; 204,396 acres of plains partly covered with bushes and scattering trees; 23,530 acres of swamp partly covered with small timber and bushes.

Atherton—Has no hardwood; 160 acres of pine; no hemlock; 400 acres of plains partly covered with bushes and scattering trees; 350 acres of swamp partly covered with small timber and bushes.

Big Creek—Has 500 acres of hardwood; 300 acres of pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Comins—Has four whole surveyed towns; 21,120 acres of hardwood; 1,910 acres of pine; no hemlock, except as interspersed with hardwood; 61,140 acres of plains covered with jack pine, poplar, scrub-oak and bushes; 2,900 acres of swamp partly covered with small timber and bushes. Hardwood includes beech, maple, basswood, birch, oak and ash, with some hemlock intespersed.

Elmer—Has two whole surveyed towns; 16,640 acres of hardwood, with hemlock interspersed; 1,640 acres of pine; no hemlock forest; 24,082 acres of plains partly covered with bushes and scattering trees; 860 acres of swamp partly covered with small timber and bushes.

Greenwood—Has two whole surveyed towns; 2,000 acres of hardwood; 8,496 acres of pine; no hemlock; 22,284 acres of plains covered with scrubby jack pine; 3,300 acres of swamp covered with cedar and tamarack.

Harmon—Has 5,000 acres of hardwood; 9,000 acres of pine; 4,000 acres of hemlock; 4,000 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Mentor—Has four whole surveyed towns; 400 acres of hardwood; no pine; no hemlock; 70,000 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes.

Mt. Pindus—Has no hardwood; 200 acres of pine; no hemlock; 21,490 acres of plains partly covered with bushes and scattering trees; 720 acres of swamp partly covered with small timber and bushes.

OTSEGO COUNTY

Has nine organized townships, consisting of fifteen whole surveyed towns; 144,939 acres of hardwood; 17,266 acres of pine; 6,965 acres of hemlock; 66,983 acres of plains partly covered with bushes and scattering trees; 20,660 acres of swamp partly covered with small timber and bushes.

Bagley—Has 3,500 acres of hardwood; no pine nor hemlock of any value; 12,000 acres of plains partly covered with bushes and scattering trees; 400 acres of swamp covered with willow bushes and coarse grass. Most of the valuable hardwood has been taken out—hemlock interspersed among the hardwood also been cut or stripped of its bark. The plains originally grew a large quantity of pine—nothing now but bushes and small trees. Statistics in this township estimated by the county surveyor.

Charlton—Has two whole surveyed towns; 15,065 acres of hardwood; interspersed with hemlock; 3,262 acres of pine; no hemlock except as interspersed with hardwood; 17,819 acres of plains partly covered with bushes and scattering trees; no swamp.

Chester—Has two whole surveyed towns; 14,558 acres of hardwood; no pine; 3,200 acres of hemlock; 16,000 acres of plains partly covered with bushes and scattering trees; 3,500 acres of swamp partly covered with small timber and bushes.

Corwith—Has three whole surveyed towns; 40,000 acres of hardwood; 1,000 acres of pine; 1,000 acres of hemlock; 2,500 acres of plains partly covered with bushes and scattering trees; 1,200 acres of swamp partly covered with small timber and bushes. Pine and hemlock, mostly interspersed among the hardwood.

Dover—Has two whole surveyed towns; 25,000 acres of hardwood; 500 acres of pine; 1,000 acres of hemlock; 3,500 acres of plains partly covered with bushes and scattering trees; 13,720 acres of swamp partly covered with small timber and bushes.

Elmira—Has 16,640 acres of hardwood, consisting of hard and soft maple, elm, basswood, birch and beech, with hemlock interspersed; no pine; no hemlock except with the hardwood; no plains; no swamp.

Hayes—Has two whole surveyed towns; 17,276 acres of hardwood, consisting of maple, basswood and elm; 12,504 acres of pine; 1,565 acres of hemlock; 10,714 acres of plains partly covered with bushes and scattering trees; 280 acres of swamp partly covered with small timber and bushes.

Livingston—Has 12,000 acres of hardwood; no pine; some hemlock interspersed among the hardwood; 4,300 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes.

Otsego Lake—Has 900 acres of hardwood; no pine; 200 acres of hemlock; 150 acres of plains partly covered with bushes and scattering trees; 60 acres of swamp partly covered with small timber and bushes.

OTTAWA COUNTY

Has fifteen organized townships, consisting of thirteen whole and five fractional surveyed towns; 32,995 acres of hardwood; 20 acres of pine; 1,600 acres of hemlock; 28,223 acres of plains partly covered with bushes and scattering trees; 13,695 acres of swamp partly covered with small timber and bushes.

Allandale—Has a part of one surveyed town; 7,000 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Blendon—Has 6,200 acres of hardwood; no pine; 200 acres of hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes.

Chester—Has 3,200 acres of hardwood, with hemlock interspersed; no pine; 100 acres of hemlock; no plains; 75 acres of swamp partly covered with small timber and bushes.

Crockery—Has nearly one surveyed town; 2,000 acres of hardwood; no pine; 200 acres of hemlock; 6,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Georgetown—Has 2,000 acres of hardwood; no pine; no hemlock; 1,500 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes. Originally there was a large amount of pine in this township.

Grand Haven—Has one fractional surveyed town; 2,000 acres of hardwood, consisting of beech, maple, elm, basswood, ash and birch; no pine; no hemlock; 4,000 acres of plains covered with oak brush; 1,500 acres of swamp partly covered with small timber and bushes.

Holland—Has one whole and one fractional surveyed town; 400 acres of hardwood; 10 acres of pine; 35 acres of hemlock; 300 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes.

Jamestown—Has 1,000 acres of hardwood; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes. Timber in small pieces.

Olive—Has one whole and one fractional surveyed town; 1,000 acres of hardwood, with hemlock interspersed; no pine; 150 acres of hemlock; 1,600 acres of plains partly covered with bushes and scattering trees; no swamp.

Polkton—Has one whole and a part of another surveyed town; 3,040 acres of hardwood; no pine; no hemlock; 800 acres of plains partly covered with bushes and scattering trees; no swamp.

Robinson—Has 600 acres of hardwood; no pine; 200 acres of hemlock; 10,000 acres of plains partly covered with bushes and scattering trees; 7,000 acres of swamp partly covered with small timber and bushes.

Spring Lake—Has one fractional surveyed town; 453 acres of hardwood; 10 acres of pine; 715 acres of hemlock; 2,275 acres of plains partly covered with bushes and scattering trees; no swamp.

Tallmage—Has 1,600 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes.

Wright—Has 2,202 acres of hardwood; no pine; no hemlock; 1,048 acres of plains partly covered with bushes and scattering trees; 620 acres of swamp partly covered with small timber and bushes. Valuable timber nearly all cut.

Zeeland—Has 300 acres of hardwood; no pine; no hemlock; 500 acres of plains partly covered with bushes and scattering trees; 400 acres of swamp partly covered with small timber and bushes. Best timber has been cut.

PRESQUE ISLE COUNTY

Has eleven organized townships, consisting of fifteen whole and eight fractional surveyed towns; 69,606 acres of hardwood; 9,086 acres of pine; 27,981 acres of hemlock; 82,261 acres of plains partly covered with bushes and scattering trees; 88,897 acres of swamp partly covered with small timber and bushes. The townships of Bearinger, Belknap and Posen were estimated by Hon. W. A. French, Commissioner of the State Land Office, as no report could be obtained from the supervisors of these townships.

Allis—Has two whole surveyed towns; 25,000 acres of hardwood, with hemlock interspersed; no pine; no hemlock, except as interspersed among hardwood; 10,000 acres of plains partly covered with bushes and scattering trees; 6,000 acres of swamp partly covered with small timber and bushes.

Bearinger—Has one whole and two fractional surveyed towns; 6,000 acres of hardwood; 1,500 acres of pine; no hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; 3,000 acres of swamp partly covered with small timber and bushes. The 6,000 acres of hardwood is more or less mixed with hemlock and cedar. There is additional scattering timber but it is only fit for fuel.

Belknap—Has one whole and three half towns; 3,000 acres of hardwood; no pine; 4,000 acres of hemlock; no plains; 2,000 acres of swamp partly covered with small timber and bushes. There is some other timber scattered through these towns only fit for fuel.

Bismarck—Has 3,840 acres of hardwood; 1,280 acres of pine; 1,280 acres of hemlock; 9,600 acres of plains partly covered with bushes and scattering trees; 6,400 acres of swamp partly covered with small timber and bushes.

Case—Has two whole surveyed towns; 10,800 acres of hardwood, consisting of beech, maple, basswood and birch, mixed with hemlock; 2,000 acres of pine; 9,000 acres of hemlock; 16,000 acres of plains partly covered with bushes and scattering trees; 7,000 acres of swamp covered with cedar, tamarack and spruce.

Krakow—Has one whole and one fractional surveyed town; 6,162 acres of hardwood; 499 acres of pine; 2,633 acres of hemlock; 7,591 acres of plains partly covered with bushes and scattering trees; 6,735 acres of swamp partly covered with small timber and bushes.

Metz—Has one whole and three half surveyed towns; 1,568 acres of hardwood; 2,120 acres of pine; 2,160 acres of hemlock; 25,400 acres of plains partly covered with bushes and scattering trees; 24,632 acres of swamp partly covered with small timber and bushes.

Moltke—Has 7,576 acres of hardwood, with hemlock interspersed; 1,687 acres of pine; 168 acres of hemlock; 550 acres of plains partly covered with bushes and scattering trees; 8,150 acres of swamp partly covered with small timber and bushes.

Posen—Has two whole and one fractional surveyed towns; 1,200 acres of hardwood; no pine; 6,000 acres of hemlock; no plains; 2,500 acres of swamp covered with cedar and spruce. There is some other timber scattered through the township, which is the best farming section in the county.

Presque Isle—Has two fractional surveyed towns; 500 acres of hardwood; no pine; 300 acres of hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; 10,000 acres of swamp partly covered with small timber and bushes.

Rogers—Has two fractional surveyed towns; 3,960 acres of hardwood; no pine, except a little in swamps; 2,400 acres of hemlock; 5,120 acres of plains partly covered with bushes and scattering trees; 12,480 acres of swamp covered with cedar, tamarack, spruce, balsam and poplar, with a few million feet of pine scattered through the same. The swamps are about half lumbered over. In this township there is 140 acres planted to fruit trees exclusively, mostly plum, which are thriving and just coming into bearing. They are near Lake Huron, where the influence of the water protects them. Even light soils seem productive of fruit.

ROSCOMMON COUNTY

Has eight organized townships, consisting of sixteen whole surveyed towns; 16,145 acres of hardwood; 4,920 acres of pine; 12,440 acres of hemlock; 131,160 acres of plains partly covered with bushes and scattering trees; 57,265 acres of swamp partly covered with small timber and bushes. Many of these towns are made fractional by the large inland lakes.

Denton—Has three surveyed towns; 3,200 acres of hardwood; 280 acres of pine; 1,940 acres of hemlock; 4,400 acres of plains partly covered with bushes and scattering trees; 6,400 acres of swamp partly covered with small timber and bushes. There is not much valuable timber in the township.

Gerrish—Has two whole surveyed towns; 2,000 acres of hardwood; no pine; 1,000 acres of hemlock; 20,000 acres of plains partly covered with bushes and scattering trees; 10,000 acres of swamp partly covered with small timber and bushes. This township was originally covered with a large pine forest.

Higgins—Has no hardwood; 640 acres of pine; 800 acres of hemlock; 10,800 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes.

Markey—Has 680 acres of hardwood; no pine except on swamps; 900 acres of hemlock; 4,560 acres of plains partly covered with bushes and scattering trees; 11,365 acres of swamp covered with cedar, hemlock, tamarack, spruce, balsam and pine. The swamp timber is quite valuable.

Nester—Has two whole surveyed towns; 3,700 acres of hardwood; 700 acres of pine; 500 acres of hemlock; 30,000 acres of plains partly covered with bushes and scattering trees; 6,000 acres of swamp partly covered with small timber and bushes.

Richfield—Has 765 acres of hardwood; 600 acres of pine; 300 acres of hemlock; 6,400 acres of plains partly covered with bushes and scattering trees; 7,000 acres of swamp partly covered with small timber and bushes.

Roscommon—Has two whole and two fractional surveyed towns; 4,000 acres of hardwood; 2,700 acres of pine; 2,000 acres of hemlock; 35,000 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp partly covered with small timber and bushes.

St. Helens—Has two whole surveyed towns; 1,800 acres of hardwood; no original pine; 5,000 acres of hemlock; 20,000 acres of plains partly covered with bushes and scattering trees; 10,000 acres of swamp thickly timbered with tamarack and cedar. There is a good quantity of second growth pine.

SAGINAW COUNTY

Has twenty-seven organized townships, consisting of nineteen whole and six parts of surveyed towns; 72,531 acres of hardwood; 2,103 acres of pine; no hemlock; 52,164 acres of plains partly covered with bushes and scattering trees; 56,677 acres of swamp partly covered with small timber and bushes.

Albee—Has 9,460 acres of hardwood, consisting of oak, ash, elm and maple; no pine; no hemlock; 1,920 acres of plains partly covered with bushes and scattering trees; 5,760 acres of swamp partly covered with small timber and bushes.

Birch Run—Has 1,500 acres of hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes. Hardwood is all in small tracts.

Blumfield—Has 100 acres of hardwood; no pine; no hemlock; no plains; 4,500 acres of swamp partly covered with small timber and bushes.

Brady—Has one whole surveyed town; 200 acres of hardwood; no pine; no hemlock; no plains; 8,200 acres of swamp partly covered with small timber and bushes.

BRANT—Has 9,000 acres of hardwood, consisting of beech, maple, elm, basswood, ash and oak; no pine; no hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; 2,500 acres of swamp partly covered with small timber and bushes.

BRIDGEPORT—Has 704 acres of hardwood; no pine; no hemlock; 2,420 acres of plains partly covered with bushes and scattering trees; 475 acres of swamp partly covered with small timber and bushes. The 2,420 acres are not "plains" but thinly timbered, fit only for firewood.

BUENA VISTA—Has 2,000 acres of hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; no swamp.

CARROLLTON—Has one fractional surveyed town; 20 acres of hardwood; no pine; no hemlock; 15 acres of plains partly covered with bushes and scattering trees; no swamp.

CHAPIN—Has one fractional surveyed town; 5,000 acres of hardwood; 2,000 acres of pine; no hemlock; no plains; 2,500 acres of swamp partly covered with small timber and bushes.

CHESANING—Has 3,000 acres of hardwood; 100 acres of pine; no hemlock; no plains; no swamp.

FRANKENMUTH—Has 35,000 acres of hardwood; no pine; no hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; no swamp.

FREMONT—Has 1,277 acres of hardwood; no pine; no hemlock; 7,160 acres of plains partly covered with bushes and scattering trees; 3,830 acres of swamp partly covered with small timber and bushes.

JAMES—Has one fractional surveyed town; 2,000 acres of hardwood; no pine; no hemlock; no plains; 5,300 acres of swamp partly covered with small timber and bushes.

JONESFIELD—Has one fractional surveyed town; 2,000 acres of hardwood; no pine; no hemlock; 4,000 acres of plains covered with poplars; no swamp.

KOCHVILLE—Has a part of one surveyed town; 1,000 acres of hardwood; consisting of elm, basswood and poplar; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; no swamp.

LAKEFIELD—Has one fractional surveyed town; 2,500 acres of hardwood; no pine; no hemlock; no plains; no swamp.

MAPLE GROVE—Has 1,090 acres of hardwood; 3 acres of pine; no hemlock; no plains; 320 acres of swamp partly covered with small timber and bushes. The valuable timber such as oak, ash and pine has been cut.

MARION—Has one fractional surveyed town; 7,720 acres of hardwood; no pine; no hemlock; no plains; 720 acres of swamp partly covered with small timber and bushes. The timber in this township is red and white oak, black and white ash, hard and soft maple, beech, basswood and elm.

RICHLAND—Has 2,500 acres of hardwood; no pine; no hemlock; 7,500 acres of plains partly covered with bushes and scattering trees; 2,300 acres of swamp partly covered with small timber and bushes.

SAGINAW—Has two fractional surveyed towns; 500 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Spaulding—Has one fractional surveyed town; 1,660 acres of hardwood; no pine; no hemlock; 6,459 acres of plains partly covered with bushes and scattering trees; 5,592 acres of swamp partly covered with small timber and bushes. All the hardwood timber is small except about 160 acres.

St. Charles—Has 10,000 acres of hardwood; no pine; no hemlock; 1,920 acres of plains partly covered with bushes and scattering trees; 5,440 acres of swamp partly covered with small timber and bushes.

Swan Creek—Has a part of one surveyed town; 300 acres of hardwood; no pine; no hemlock; 4,000 acres of plains partly covered with bushes and scattering trees; 7,700 acres of swamp partly covered with small timber and bushes.

Taymouth—Has 4,000 acres of hardwood; no pine; no hemlock; 5,700 acres of plains partly covered with bushes and scattering trees; 450 acres of swamp partly covered with small timber and bushes. The hardwood land is not heavily timbered.

Thomastown—Has a part of two surveyed towns; 300 acres of hardwood; no pine; no hemlock; no plains; no swamp. About 40 per cent of this township is pine stump land on which there is nothing that can be classed as timber.

Tittabawassee—Has 1,200 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Zilwaukee—Has a part of one surveyed town; no hardwood; no pine; no hemlock; 70 acres of plains partly covered with bushes and scattering trees; 90 acres of swamp partly covered with small timber and bushes.

SANILAC COUNTY

Has twenty-six organized townships, consisting of twenty-three whole and six fractional surveyed towns; 9,078 acres of hardwood: 10 acres of pine; 20 acres of hemlock; 54,495 acres of plains partly covered with bushes and scattering trees; 62,996 acres of swamp partly covered with small timber and bushes.

Argyle—Has 111 acres of hardwood; no pine; 10 acres of hemlock; 13,322 acres of plains partly covered with bushes and scattering trees; 390 acres of swamp partly covered with small timber and bushes. The timber in this township consists of elm, soft maple, black ash, beech, oak and tamarack.

Austin—Has 12 acres of hardwood; no pine; no hemlock; 700 acres of plains covered with poplars; 83 acres of swamp partly covered with small timber and bushes.

Bridgehampton—Has 640 acres of hardwood; no pine; no hemlock; 5,000 acres of plains covered with poplars; no swamp.

Buel—Has 300 acres of hardwood; no pine; no hemlock; 7,200 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Custer—Has no hardwood; no pine; no hemlock; 2,400 acres of plains partly covered with bushes and scattering trees; 6,800 acres of swamp partly covered with small timber and bushes.

Delaware—Has one whole and one fractional surveyed town; no hardwood; no pine; no hemlock; 500 acres of plains partly covered with bushes and scattering trees; no swamp.

Elk—Has 280 acres of hardwood; no pine; no hemlock; 430 acres of plains partly covered with bushes and scattering trees; 900 acres of swamp partly covered with small timber and bushes.

Elmer—Has 520 acres of hardwood; no pine; 10 acres of hemlock; 1,500 acres of plains partly covered with bushes and scattering trees; 10,000 acres of swamp partly covered with small timber and bushes.

Evergreen—Has 160 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Flynn—Has 90 acres of hardwood; no pine; no hemlock; no plains; 800 acres of swamp partly covered with small timber and bushes.

Forester—Has two fractional surveyed towns; 50 acres of hardwood; no pine; no hemlock; 2,460 acres of plains partly covered with bushes and scattering trees; no swamp.

Fremont—Has 720 acres of hardwood; no pine; no hemlock; 3,000 acres of plains partly covered with hardwood timber; 3,000 acres of swamp partly covered with small timber and bushes.

Greenleaf—Has 220 acres of hardwood; no pine; no hemlock; 500 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp covered with willow. Before the fires of 1871 and 1881 the highlands were covered with maple, beech, hemlock and cork pine; now the unimproved highlands are covered with poplar, white birch and willow.

Lamotte—Has 40 acres of hardwood; no pine; no hemlock; no plains; 4,800 acres of swamp partly covered with small timber and bushes.

Lexington—Has 400 acres of hardwood, with pine and hemlock interspersed; no pine; no hemlock, except among the hardwood; 900 acres of plains, thickly covered with poplar and willow; no swamp.

Maple Valley—Has no hardwood; no pine; no hemlock; no plains; 1,600 acres of swamp partly covered with small timber and bushes.

Marion—Has 55 acres of hardwood; no pine; no hemlock; 3,350 acres of plains partly covered with bushes and scattering trees; no swamp.

Marlette—Has one whole and part of another surveyed town; 200 acres of hardwood; no pine; no hemlock; 280 acres of plains partly covered with bushes and scattering trees; 1,960 acres of swamp partly covered with small timber and bushes.

Minden—Has 50 acres of hardwood; no pine; no hemlock; no plains; 10,000 acres of swamp covered with scrub tamarack and huckleberry and cranberry bushes.

Moore—Has no hardwood; no pine; no hemlock; 7,253 acres of plains partly covered with bushes and scattering trees; 9,253 acres of swamp partly covered with small timber and bushes.

Sanilac—Has two fractional surveyed towns; 20 acres of hardwood; no pine; but little hemlock; 600 acres of plains partly covered with bushes and scattering trees; no swamp. Principal timber is poplar, mixed with birch, maple, beech and hemlock.

Speaker—Has 450 acres of hardwood; 10 acres of pine; but little hemlock; no plains; 210 acres of swamp partly covered with small timber and bushes. Small hemlock interspersed with the pine. There is not to exceed 70 acres of original forest in the township. There is a number of thousand acres of land without a tree or bush on it.

Washington—Has 40 acres of hardwood; no pine; no hemlock; 5,100 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes. The plains were formerly covered with heavy timber.

Watertown—Has 720 acres of hardwood; no pine; no hemlock; no plains; 3,500 acres of swamp partly covered with small timber and bushes. There is no real timber in this township, the little left consists of soft maple and ash. The fires of 1871 and 1881 destroyed nearly all of value. This township was estimated by D. P. Morse and Henry Ruttle.

Wheatland—Has 3,900 acres of hardwood; no pine; no hemlock; no plains; 5,200 acres of swamp partly covered with small timber and bushes.

Worth—Has 100 acres of hardwood, consisting of beech and maple; no pine; no hemlock; no plains; no swamp.

SCHOOLCRAFT COUNTY

Has eight organized townships, consisting of thirty-one whole and six fractional surveyed towns; 140,459 acres of hardwood; 61,367 acres of pine; 105,218 acres of hemlock; 221,960 acres of plains partly covered with bushes and scattering trees; 207,263 acres of swamp partly covered with small timber and bushes.

Doyle—Has five whole and two fractional surveyed towns; 21,000 acres of hardwood; 9,000 acres of pine; 14,000 acres of hemlock; 44,000 acres of plains partly covered with bushes and scattering trees; 36,000 acres of swamp partly covered with small timber and bushes.

Germfask—Has three whole surveyed towns; 29,040 acres of hardwood; no pine; 1,500 acres of hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; 20,000 acres of swamp partly covered with small timber and bushes. There is some pine in the township scattered through the hardwood and swamp lands.

Harrison—Has six whole and four parts of surveyed towns; 24,373 acres of hardwood; 19,155 acres of pine; 73,900 acres of plains partly covered with bushes and scattering trees; 53,937 acres of swamp partly covered with small timber and bushes. There is considerable hemlock mixed with the hardwood and pine.

Hiawatha—Has two whole and four parts of surveyed towns; 11,600 acres of hardwood; 18,800 acres of pine; 86,500 acres of hemlock; 8,000 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes.

Inwood—Has 9,046 acres of hardwood; 72 acres of pine; 1,218 acres of hemlock; 80,420 acres of plains partly covered with bushes and scattering trees; 856 acres of swamp, heavily timbered with cedar, tamarack, birch and hemlock.

Manistique—Has four whole and one fractional surveyed towns; 8,740 acres of hardwood, consisting mostly of oak and maple, with some beech; 2,520 acres of pine; no hemlock; 32,640 acres of plains partly covered with bushes and scattering trees; 53,810 acres of swamp partly covered with small timber and bushes.

Seney—Has six whole surveyed towns; 34,560 acres of hardwood, consisting of birch, beech and maple of an inferior grade; 11,520 acres of pine; 1,000 acres of hemlock; 50,000 acres of plains partly covered with bushes and scattering trees; 41,160 acres of swamp partly covered with small timber and bushes. The hemlock timber is short and scrubby. Pine is of very fair quality.

Thompson—Has three fractional surveyed towns; 2,100 acres of hardwood; 300 acres of pine; 1,000 acres of hemlock; no plains; no swamp.

SHIAWASSEE COUNTY

Has sixteen organized townships consisting of twelve whole and four fractional surveyed towns; 32,841 acres of hardwood; no pine; no hemlock; 1,247 acres of plains partly covered with bushes and scattering trees; 18,744 acres of swamp partly covered with small timber and bushes.

Antrim—Has 500 acres of hardwood; no pine; no hemlock; 500 acres of plains partly covered with bushes and scattering trees; 1,500 acres of swamp partly covered with small timber and bushes.

Bennington—Has 3,000 acres of hardwood; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes.

Burns—Has 2,467 acres of hardwood, mostly oak, interspersed with ash, soft maple and elm; no pine; no hemlock; 47 acres of plains partly covered with bushes and scattering trees; 361 acres of swamp covered with tamarack, willow and poplar.

Caledonia—Has 1,900 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Fairfield—Has one fractional surveyed town; 1,050 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp parly covered with ash and tamarack. Timber is light, mostly oak, elm, maple and basswood.

Hazelton—Has 3,092 acres of hardwood; no pine; no hemlock; no plains; 50 acres of swamp partly covered with small timber and bushes.

Middlebury—Has one fractional surveyed town; 1,695 acres of hardwood; no pine; no hemlock; no plains; 1,000 acres of swamp partly covered with small timber and bushes.

New Haven—Has 3,600 acres of hardwood; no pine; no hemlock; no plains; no swamp. Very little valuable timber in the township.

Owosso—Has 2,546 acres of hardwood; no pine; no hemlock; no plains; 1,000 acres of swamp partly covered with small timber and bushes. The timber in this township consists of maple, elm, oak, basswood, beech and tamarack.

Perry—Has 3,500 acres of hardwood; no pine; no hemlock; no plains; 800 acres of swamp partly covered with small timber and bushes.

Rush—Has 1,775 acres of hardwood; no pine; no hemlock; no plains; 2,950 acres of swamp partly covered with small timber and bushes. About one-half of the "hardwood" is elm, basswood and other varieties of soft (hard) wood.

Sciota—Has one fractional surveyed town; 1,416 acres of hardwood; no pine; no hemlock; no plains; 2,350 acres of swamp partly covered with small timber and bushes. The timber consists mostly of oak, elm and ash. The valuable timber has been cut.

Shiawassee—Has 1,750 acres of hardwood; no pine; no hemlock; no plains; 2,497 acres of swamp partly covered with small timber and bushes.

Venice—Has 2,500 acres of hardwood; no pine; no hemlock; no plains; 560 acres of swamp partly covered with small timber and bushes.

Vernon—Has 1,600 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Woodhull—Has one fractional surveyed town; 450 acres of hardwood; no pine; no hemlock; 300 acres of plains partly covered with bushes and scattering trees; 4,076 acres of swamp partly covered with small timber and bushes.

ST. CLAIR COUNTY

Has twenty-three organized townships, consisting of seventeen whole and eight fractional surveyed towns; 24,368 acres of hardwood; 700 acres of pine; no hemlock; 31,516 acres of plains partly covered with bushes and scattering trees; 12,860 acres of swamp partly covered with small timber and bushes.

Berlin—Has 1,600 acres of hardwood; no pine; no hemlock; no plains; 3,000 acres of swamp partly covered with small timber and bushes.

Brockway—Has 1,140 acres of hardwood; no pine; no hemlock; 500 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Burtchville—Has one fractional surveyed town; 200 acres of hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Casco—Has 300 acres of hardwood; no pine; no hemlock; 2,905 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

China—Has one fractional surveyed town; 2,500 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 300 acres of swamp partly covered with small timber and bushes.

Clay—Has two fractional surveyed towns; 1,000 acres of hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering tres; no swamp.

Clyde—Has 1,100 acres of hardwood; 175 acres of pine; no hemlock; 4,300 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Columbus—Has 575 acres of hardwood; no pine; no hemlock; 2,500 acres of plains covered with bushes and scattering trees; no swamp.

Cottrellville—Has two fractional surveyed towns; 1,700 acres of hardwood; no pine; no hemlock; no plains; no swamp. Most of the good timber has been cut.

East China—Has one fractional surveyed town; no hardwood; no pine; no hemlock; 335 acres of plains partly covered with bushes and scattering trees; no swamp.

Emmet—Has 864 acres of hardwood, consisting of beech, maple, oak, ash and elm; no pine; no hemlock; no plains; 640 acres of swamp partly covered with bushes and timber. This township was estimated by Wm. Powers.

Fort Gratiot—Has 300 acres of hardwood; no pine; no hemlock; 3,020 acres of plains partly covered with bushes and scattering trees; 430 acres of swamp partly covered with small timber and bushes.

Grant—Has a part of one surveyed town; 800 acres of hardwood, mostly second growth; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; no swamp.

Greenwood—Has 3,500 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Ira—Has one fractional surveyed town; 1,200 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes. This township has not much elevation above Lake St. Clair, and, strictly speaking, there is no real hardwood timber, the 1,200 acres mentioned being not more than one-fourth covered with timber. Report made by estimate of County Surveyor J. L. Paldi.

Kenockee—Has 1,440 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Kimball—Has 300 acres of hardwood; no pine; no hemlock; 6,400 acres of plains partly covered with bushes and scattering trees; no swamp. Timber good only for wood.

Lynn—Has 1,150 acres of hardwood; no pine; no hemlock; no plains; 690 acres of swamp partly covered with small timber and bushes. This township was estimated by J. M. Sterling, as the supervisor would make no report.

Mussey—Has 2,219 acres of hardwood; no pine; no hemlock; 2,456 acres of plains partly covered with bushes and scattering trees; 4,000 acres of swamp partly covered with small timber and bushes.

Port Huron—Has one fractional surveyed town; 80 acres of hardwood; 25 acres of pine; no hemlock; 800 acres of plains partly covered with bushes and scattering trees; no swamp.

Riley—Has 1,400 acres of hardwood; no pine no hemlock; 1,200 acres of plains partly covered with bushes and scattering trees; 100 acres of swamp partly covered with small timber and bushes.

St. Clair—Has one whole and one fractional surveyed town; no hardwood; no pine; no hemlock; 3,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes. The timber in this township is second growth pine, elm, black ash and poplar.

Wales—Has 1,000 acres of hardwood; 500 acres of pine; no hemlock; 1,500 acres of plains partly covered with scattering elm and ash; 100 acres of swamp partly covered with small timber and bushes. There is but little good hardwood in this township.

ST. JOSEPH COUNTY

Has sixteen organized townships, consisting of twelve whole and four fractional surveyed towns; 21,069 acres of hardwood; no pine; no hemlock; 1,829 acres of plains partly covered with bushes and scattering trees; 9,189 acres of swamp partly covered with small timber and bushes.

Burr Oak—Has 741 acres of hardwood, consisting of oak, ash, elm, beech, maple poplar and basswood; no pine; no hemlock; no plains; 394 acres of swamp partly covered with tamarack and elm.

Colon—Has 1,243 acres of hardwood; no pine; no hemlock; no plains; 447 acres of swamp partly covered with small timber and bushes.

Constantine—Has 764 acres of hardwood; no pine; no hemlock; no plains; 2,719 acres of swamp partly covered with bushes and scattering trees. The timber in this township is second growth oak, tamarack and willow.

Fabius—Has 3,400 acres of hardwood, consisting of beech, maple and oak; no pine; no hemlock; 700 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Fawn River—Has one fractional surveyed town; 891 acres of hardwood; no pine; no hemlock; no plains; no swamp. The timber in this township is second growth oak.

Florence—Has 1,050 acres of hardwood; no pine; no hemlock; no plains; 350 acres of swamp partly covered with small timber and bushes.

Flowerfield—Has 1,000 acres of hardwood; no pine; no hemlock; no plains; 400 acres of swamp partly covered with small timber and bushes.

Leonidas—Has 1,950 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes.

Lockport—Has 1,315 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Mendon—Has 1,800 acres of hardwood; no pine; no hemlock; 800 acres of plains partly covered with bushes and scattering trees; 800 acres of swamp partly covered with small timber and bushes.

Mottville—Has one fractional surveyed town; 660 acres of hardwood; no pine; no hemlock; no plains; 73 acres of swamp partly covered with small timber and bushes. Some of the hardwood is basswood, sycamore and elm.

NOTTAWA—Has 1,755 acres of hardwood; no pine; no hemlock; no plains; no swamp.

PARK—Has 1,025 acres of hardwood, consisting of beech and oak; no pine; no hemlock; no plains; no swamp.

SHERMAN—Has 2,265 acres of hardwood; no pine; no hemlock; no plains; 1,906 acres of swamp partly covered with small timber and bushes. The timber in this township has been culled.

STURGIS—Has one fractional surveyed town; 597 acres of hardwood; no pine; no hemlock; 229 acres of plains partly covered with bushes and scattering trees; 450 acres of swamp partly covered with small timber and bushes. The timber in this township consists of white and black oak and hickory.

WHITE PIGEON—Has one fractional surveyed town; 613 acres of hardwood; no pine; no hemlock; 100 acres of plains partly covered with bushes and scattering trees; 150 acres of swamp partly covered with small timber and bushes.

TUSCOLA COUNTY

Has twenty-three organized townships, consisting of twenty-two whole and two fractional surveyed towns; 36,470 acres of hardwood; 105 acres of pine; 1,420 acres of hemlock; 77,713 acres of plains partly covered with bushes and scattering trees; 52,368 acres of swamp partly covered with small timber and bushes.

AKRON—Has one whole and one fractional surveyed town; 1,000 acres of hardwood; no pine; no hemlock; 4,000 acres of plains partly covered with bushes and scattering trees; 6,000 acres of swamp partly covered with small timber and bushes.

ALMER—Has one surveyed town; 3,000 acres of hardwood, consisting of beech, maple, elm and ash; no pine; no hemlock; no plains; no swamp.

ARBELA—Has 3,640 acres of hardwood; no pine; no hemlock; no plains; 80 acres of swamp partly covered with small timber and bushes.

COLUMBIA—Has one whole and a part of another surveyed town; 4,500 acres of hardwood; 80 acres of pine; 240 acres of hemlock; 350 acres of plains partly covered with bushes and scattering trees; 3,040 acres of swamp partly covered with small timber and bushes.

DAYTON—Has 860 acres of hardwood; no pine; 200 acres of hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 1,140 acres of swamp partly covered with small timber and bushes.

DENMARK—Has 1,500 acres of hardwood; no pine; no hemlock; no plains; no swamp. The timber in this township is beech and maple, with scattering ash and elm interspersed.

ELKLAND—Has 820 acres of hardwood; 5 acres of pine; no hemlock; 1,870 acres of plains partly covered with bushes and scattering trees; 5,580 acres of swamp partly covered with small timber and bushes.

ELLINGTON—Has 1,031 acres of hardwood; 20 acres of pine; 100 acres of hemlock; no plains; 14,000 acres of swamp partly covered with small timber and bushes. The pine and hemlock in this township is interspersed with hardwood and swamp timber.

Elmwood—Has 100 acres of hardwood; no pine; no hemlock; 8,000 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Fair Grove—Has 3,138 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Fremont—Has 5,500 acres of hardwood; no pine; 200 acres of hemlock; no plains; 4,500 acres of swamp partly covered with small timber and bushes.

Gilford—Has 1,000 acres of hardwood, consisting of beech and maple; no pine; no hemlock; 160 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp heavily timbered with elm and black ash.

Indian Fields—Has 300 acres of hardwood, fit for fuel only; no pine; 200 acres of hemlock; 10,000 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes.

Juniata—Has 1,660 acres of hardwood; no pine; 200 acres of hemlock; 2,380 acres of plains covered with poplar; 1,000 acres of swamp covered with cedar and tamarack.

Kingston—Has 150 acres of hardwood, consisting of beech and maple; no pine; no hemlock; 8,000 acres of plains partly covered with bushes and scattering trees; 5,000 acres of swamp partly covered with small timber and bushes.

Koylton—Has 105 acres of hardwood; no pine; 40 acres of hemlock; no plains; 1,020 acres of swamp partly covered with small timber and bushes.

Millington—Has 600 acres of hardwood; no pine; no hemlock; 700 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Novesta—Has 740 acres of hardwood; no pine; no hemlock; 12,200 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Tuscola—Has 1,300 acres of hardwood; no pine; 60 acres of hemlock; 20 acres of plains partly covered with bushes and scattering trees; 1,200 acres of swamp partly covered with small timber and bushes.

Vassar—Has 831 acres of hardwood; no pine; 180 acres of hemlock; 10,538 acres of plains partly covered with bushes and scattering trees; 308 acres of swamp partly covered with small timber and bushes.

Watertown—Has 1,085 acres of hardwood; no pine; no hemlock; 6,495 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes. Hardwood consists of beech and maple.

Wells—Has 10 acres of hardwood; no pine; no hemlock; 11,000 acres of plains covered with poplar; 500 acres of swamp partly covered with small timber and bushes.

Wisner—Has one fractional surveyed town; 3,600 acres of hardwood; no pine; no hemlock; no plains; 600 acres of swamp partly covered with small timber and bushes. Timber consists of elm, ash, oak and some hickory and cedar. The oak is scrub oak.

VAN BUREN COUNTY

Has eighteen organized townships consisting of seventeen whole and one fractional surveyed town; 28,355 acres of hardwood; 20 acres of pine; no hemlock; 17,811 acres of plains partly covered with bushes and scattering trees; 22,647 acres of swamp partly covered with small timber and bushes.

Almena—Has 600 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 4,500 acres of swamp partly covered with small timber and bushes. The hardwood timber is in small pieces. Timber consists of white and yellow oak, beech, soft maple, black ash and elm.

Antwerp—Has 2,000 acres of hardwood, consisting of second growth oak; no pine; no hemlock; 611 acres of plains partly covered with bushes and scattering trees; 700 acres of swamp partly covered with small timber and bushes.

Arlington—Has 1,800 acres of hardwood; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes. There is only one large lot of timber left in this township and that is being removed.

Bangor—Has 2,070 acres of hardwood; no pine; no hemlock; 900 acres of plains partly covered with bushes and scattering trees; 2,000 acres of swamp partly covered with small timber and bushes. The timber in this township has been culled. This township was once entirely covered with a heavy growth of hardwood.

Bloomingdale—Has 1,452 acres of hardwood; no pine; no hemlock; no plains; 680 acres of swamp partly covered with small timber and bushes.

Columbia—Has 980 acres of hardwood; no pine; no hemlock; 4,550 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Covert—Has 2,000 acres of hardwood; no pine; no hemlock; 4,000 acres of plains partly covered with bushes and scattering trees; 1,200 acres of swamp partly covered with small timber and bushes. Fire has destroyed most of the good timber.

Decatur—Has 1,159 acres of hardwood; no pine; no hemlock; no plains; 3,968 acres of swamp partly covered with small timber and bushes.

Geneva—Has 1,059 acres of hardwood; no pine; no hemlock; 2,000 acres of plains, which are hemlock slashings; 1,000 acres of swamp partly covered with small timber and bushes. The hardwood is in small pieces.

Hamilton—Has 1,595 acres of hardwood; no pine, no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes.

Hartford—Has 1,595 acres of hardwood; no pine; no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes.

Keeler—Has 1,200 acres of hardwood; no pine; no hemlock; 1,550 acres of plains partly covered with bushes and scattering trees; 900 acres of swamp partly covered with small timber and bushes.

Lawrence—Has 1,200 acres of hardwood; no pine; no hemlock; no plains; 75 acres of swamp partly covered with small timber and bushes. There are no large forests in this township.

Paw Paw—Has 150 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 1,700 acres of swamp partly covered with small timber and bushes. The hardwood timber in this township is in small lots of 5 to 10 acres, left for wood. The swamps have been covered with elm, ash and other soft woods.

Pine Grove—Has 3,310 acres of hardwood; 20 acres of pine; no hemlock; no plains; 800 acres of swamp partly covered with small timber and bushes. The timber in this township was originally pine but now is oak grubs.

Porter—Has 1,540 acres of hardwood, consisting of oak, ash, beech and maple with some elm and basswood; no pine; no hemlock; no plains; 450 acres of swamp, quite heavily timbered with tamarack, ash, soft maple, elm and basswood.

South Haven—Has one fractional surveyed town; 1,000 acres of hardwood; no pine; no hemlock; 3,800 acres of plains partly covered with bushes and scattering trees; 650 acres of swamp partly covered with small timber and bushes. There are no large forests in this township.

Waverly—Has 5,000 acres of hardwood; no pine; no hemlock; no plains; 1,200 acres of swamp partly covered with small timber and bushes. There is only small wood lots left in this township and some swamp timber next the creeks and river, elm predominating.

WASHTENAW COUNTY

Has twenty organized townships; 37,976 acres of hardwood; no pine; no hemlock; 3,645 acres of plains partly covered with bushes and scattering trees; 17,217 acres of swamp partly covered with small timber and bushes.

Ann Arbor—Has 650 acres of hardwood, consisting of oak; no pine; no hemlock; no plains; no swamp.

Augusta—Has 350 acres of hardwood, consisting of oak, beech, ash, whitewood, basswood and maple; no pine; no hemlock; 600 acres of plains partly covered with bushes and scattering trees; 450 acres of swamp partly covered with small timber and bushes.

Bridgewater—Has 1,496 acres of hardwood; no pine; no hemlock; 2,100 acres of plains partly covered with bushes and scattering trees; 1,320 acres of swamp partly covered with small timber and bushes.

Dexter—Has 1,120 acres of hardwood; no pine; no hemlock; no plains; no swamp. Timber in this township is principally oak, with some ash and elm.

Freedom—Has 2,650 acres of hardwood, consisting of ash, oak and elm; no pine; no hemlock; 100 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

Lima—Has 700 acres of hardwood; no pine; no hemlock; no plains; 300 acres of swamp partly covered with small timber and bushes.

Lodi—Has 1,800 acres of hardwood, consisting of oak, ash, basswood, elm and maple. It has been culled and no good timber is left; no pine; no hemlock; no plains; 500 acres of swamp partly covered with small timber and bushes.

Lyndon—Has 1,652 acres of hardwood, consisting of second growth yellow and white oak; no pine; no hemlock; no plains; 820 acres of swamp, mostly covered with tamarack.

Manchester—Has 400 acres of hardwood; no pine; no hemlock; no plains; 100 acres of swamp partly covered with small timber and bushes.

Northfield—Has 5,000 acres of hardwood; no pine; no hemlock; no plains; 4,000 acres of swamp partly covered with small timber and bushes.

Pittsfield—Has 1,275 acres of hardwood, from which the largest trees have been cut; no pine; no hemlock; 220 acres of plains partly covered with bushes and scattering trees; no swamp.

Salem—Has 2,470 acres of hardwood, consisting of oak, ash, maple, beech, elm and basswood; no pine; no hemlock; no plains; 200 acres of swamp partly covered with small timber and bushes. This township was originally covered with hardwood forest and oak openings.

Saline—There is no large timber, all forest that is left is small timber, the supervisor did not return the amount; no pine; no hemlock; no plains; no swamp.

Scio—Has 3,000 acres of hardwood; no pine; no hemlock; no plains; no swamp. There is not much timber fit for lumber in this township.

Sharon—Has 4,201 acres of hardwood; no pine; no hemlock; 550 acres of plains partly covered with bushes and scattering trees; 1,320 acres of swamp partly covered with small timber and bushes. The timbered lands in this township are covered with scrubby trees.

Superior—Has 2,360 acres of hardwood; no pine; no hemlock; no plains; 137 acres of swamp partly covered with small timber and bushes.

Sylvan—Has 2,806 acres of hardwood; no pine; no hemlock; no plains; 2,145 acres of swamp covered with bushes and timber.

Webster—Has 3,096 acres of hardwood; no pine; no hemlock; no plains; 3,225 acres of swamp partly covered with small timber and bushes.

York—Has 2,100 acres of hardwood; no pine; no hemlock; no plains; 1,500 acres of swamp partly covered with small timber and bushes.

Ypsilanti—Has 850 acres of hardwood; no pine; no hemlock; 75 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

WAYNE COUNTY

Has twenty-one surveyed towns, nine of which are fractional, or parts of towns; nineteen organized townships; 22,262 acres of hardwood; no pine; no hemlock; 8,183 acres of plains partly covered with bushes and scattering trees; 6,686 acres of swamp partly covered with small timber and bushes.

Brownstown—Has two fractional surveyed towns; 5,000 acres of hardwood; no pine; no hemlock; 1,800 acres of plains partly covered with bushes and scattering trees; no swamp.

Canton—Has 1,280 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Dearborn—Has 478 acres of hardwood; no pine; no hemlock; 120 acres of plains partly covered with bushes and scattering trees; 228 acres of swamp partly covered with small timber and bushes.

Ecorse—Has one fractional surveyed town; 125 acres of hardwood; no pine; no hemlock; 125 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes. The timber in this township is mixed.

Gratiot—Has one fractional surveyed town; 100 acres of hardwood; no pine; no hemlock; 600 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Greenfield—Has no hardwood; no pine; no hemlock; no plains; 2,000 acres of swamp partly covered with small timber and bushes.

Grosse Pointe—Has one fractional surveyed town, containing about 900 acres; 200 acres of hardwood; no pine; no hemlock; 200 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes. Has but little timber, being one of the oldest settled townships in the State.

Hamtramck—Has one fractional surveyed town; 200 acres of hardwood; no pine; no hemlock; 580 acres of plains partly covered with bushes and scattering trees; no swamp.

Huron—Has 1,600 acres of hardwood; no pine; no hemlock; 1,000 acres of plains partly covered with bushes and scattering trees; 200 acres of swamp partly covered with small timber and bushes.

Livonia—Has 2,400 acres of hardwood, consisting of oak, elm, black and white ash, basswood, hard and soft maple, beech and poplar; no pine; no hemlock; 1,200 acres of plains partly covered with bushes and scattering trees; 800 acres of swamp partly covered with small timber and bushes.

Monguagon—Has one fractional surveyed town; no hardwood; no pine; no hemlock; no plans; 120 acres of swamp partly covered with small timber and bushes.

Nankin—Has 1,440 acres of hardwood, consisting of oak, elm, beech, maple and ash; no pine; no hemlock; 2,280 acres of plains partly covered with bushes and scattering trees; no swamp.

Plymouth—Has 1,200 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Redford—Has 1,356 acres of hardwood, consisting of oak, hickory, beech, maple, elm, ash and a few walnut and butternut, and has been culled; no pine; no hemlock; 228 acres of plains partly covered with bushes and scattering trees; no swamp.

Romulus—Has 2,520 acres of hardwood; no pine; no hemlock; no plains; no swamp.

Springwells—Has no hardwood; no pine; no hemlock; no plains; no swamp.

Sumpter—Has 1,763 acres of hardwood; no pine; no hemlock; no plains; 1,763 acres of swamp partly covered with small timber and bushes. The timber in this township consists of white and swamp oak, elm, basswood, hickory, beech and soft maple.

Taylor—Has a part of one surveyed town; 1,000 acres of hardwood, consisting of beech, maple, elm, oak, ash and basswood; no pine; no hemlock; no plains; 345 acres of swamp partly covered with small timber and bushes.

Van Buren—Has 1,600 acres of hardwood; no pine; no hemlock; 50 acres of plains partly covered with bushes and scattering trees; 30 acres of swamp partly covered with small timber and bushes.

WEXFORD COUNTY

Has sixteen organized townships, consisting of sixteen whole surveyed towns; 120,312 acres of hardwood; 3,700 acres of pine; 10,920 acres of hemlock; 63,480 acres of plains partly covered with bushes and scattering trees; 20,720 acres of swamp partly covered with small timber and bushes.

Antioch—Has 18,860 acres of hardwood, with hemlock and cedar interspersed; no pine; no hemlock, except as interspersed among hardwood; 280 acres of plains partly covered with bushes and scattering trees; no swamp.

Boon—Has 10,000 acres of hardwood, with hemlock interspersed; no pine; no hemlock, except as mixed with hardwood; 3,000 acres of plains partly covered with bushes and scattering trees; no swamp. The valuable timber has all been cut.

Cedar Creek—Has 4,295 acres of hardwood, with hemlock interspersed; no pine; no hemlock, except as interspersed with hardwood; 3,500 acres of plains partly covered with bushes and scattering trees; 260 acres of swamp partly covered with small timber and bushes.

Cherry Grove—Has 3,320 acres of hardwood; no pine; 1,780 acres of hemlock; 6,380 acres of plains partly covered with bushes and scattering trees; 1,505 acres of swamp partly covered with small timber and bushes.

Clam Lake—Has 3,000 acres of hardwood, with some hemlock interspersed; no pine; a very little hemlock mixed with the hardwood; no plains; 200 acres of swamp partly covered with small timber and bushes.

Colfax—Has 16,352 acres of hardwood; no pine; 1,900 acres of hemlock; 600 acres of plains partly covered with bushes and scattering trees; 320 acres of swamp covered with cedar and hemlock.

Greenwood—Has 4,320 acres of hardwood, with hemlock interspersed; 240 acres of pine; 1,060 acres of hemlock; 1,160 acres of plains partly covered with bushes and scattering trees; 2,070 acres of swamp partly covered with small timber and bushes. The timber in this township consists of beech, maple, birch, basswood, elm, cherry, ash, hemlock, cedar, tamarack, spruce and balsam.

Hanover—Has 3,360 acres of hardwood, with hemlock and cedar interspersed; no pine; no hemlock, except as mixed with hardwood; 3,160 acres of plains partly covered with bushes and scattering trees; no swamp. Timber in this township consists of beech, maple, hemlock and cedar.

Harring—Has 655 acres of hardwood, consisting of beech, maple, elm and basswood; 2,940 acres of pine; 40 acres of hemlock; 15,080 acres of plains partly covered with bushes and scattering trees; 480 acres of swamp partly covered with small timber and bushes.

Henderson—Has 15,700 acres of hardwood; no pine; no hemlock, except as mixed with other timber; no plains; no swamp. The timber in this township is all mixed, beech, maple, elm, basswood, hemlock, white ash and cherry.

Liberty—Has 1,090 acres of hardwood; 70 acres of pine; 1,740 acres of hemlock; 11,000 acres of plains partly covered with bushes and scattering trees; 7,345 acres of swamp partly covered with small timber and bushes.

Selma—Has 8,000 acres of hardwood; 10 acres of pine; 400 acres of hemlock; 5,000 acres of plains partly covered with bushes and scattering trees; 4,040 acres of swamp partly covered with tamarack.

Slagle—Has 2,500 acres of hardwood; 40 acres of pine; 1,500 acres of hemlock; 8,000 acres of plains partly covered with bushes and scattering trees; 1,000 acres of swamp partly covered with small timber and bushes.

South Branch—Has 9,860 acres of hardwood, with hemlock interspersed; no pine; no hemlock except as interspersed among hardwood; 2,320 acres of plains partly covered with bushes and scattering trees; no swamp. This township used to have considerable pine.

Springville—Has 9,000 acres of hardwood; no pine; 500 acres of hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 500 acres of swamp partly covered with small timber and bushes.

Wexford—Has 10,000 acres of hardwood; 400 acres of pine; 2,000 acres of hemlock; 2,000 acres of plains partly covered with bushes and scattering trees; 3,000 acres of swamp partly covered with small timber and bushes.

Recapitulation by counties.

Name of county.	Number of surveyed townships and fractions.	Number acres of standing hardwood in county.	Number acres of standing pine in county.	Number acres of standing hemlock in county.	Number acres of plains partly covered with bushes and scattering trees in county.	Number acres of swamps partly covered with small timber and bushes in county.
Alcona	20	30;387	1,640	13,620	185,000	34,580
Alger	27	297,140	22,800	46,064	66,260	63,640
Allegan	24	29,768	83	70	72,030	23,163
Alpena	23	23,960	80	15,440	119,640	87,240
Antrim	16	153,845	5,800	12,539	28,058	14,449
Arenac	13	35,745	160	2,677	33,875	16,790
Baraga	31	218,403	61,000	117,000	68,700	47,818
Barry	16	39,691	none	none	3,149	19,579
Bay	17	23,278	"	9,720	42,165	14,240
Benzie	13	61,747	1,950	3,540	48,876	7,915
Berrien	26	35,383	230	320	9,932	29,663
Branch	16	24,901	none	none	1,570	12,858
Calhoun	20	27,571	1	"	6,060	23,609
Cass	16	23,468	none	200	2,846	27,981
Charlevoix	22	82,854	2,835	10,934	38,308	19,220
Cheboygan	28	188,155	7,595	38,446	96,845	61,003
Chippewa	67	254.787	69,940	119,570	194,170	139,825
Clare†	16	81,725	440	6,880	64,210	23,170
Clinton	16	34,525	none	none	900	17,825
Crawford‡	16	15,455	18,000	1,800	173,648	23,676
Delta	52	129,357	39,021	111,408	121,942	158,647
Dickinson §	25	164,283	23,780	12,100	187,084	65,100
Eaton	16	30,878	none	none	5,450	23,224
Emmet	23	142,258	1,540	26,160	24,040	31,640
Genesee	18	87,346	225	none	7,921	7,993
Gladwin	16	55,980	3,160	15,740	90,900	48,600
Gogebic	42	586,800	32,800	47,000	20,000	43,000
Grand Traverse	17	81,618	4,369	9,033	90,368	22,992
Gratiot	17	58,420	30	none	18.325	15,715
Hillsdale	20	82,458	none	"	2,350	10,759
Houghton	35	277,606	41,750	66,180	108,478	30,650
Huron	31	21,826	430	90	56,306	49,845
Ingham	16	36,120	none	none	1,265	17,296
Ionia	16	27,532	20	"	1,810	18,694
Iosco	18	18,185	2,700	6,060	148,855	49,230
Iron	37	203,870	31,860	26,400	54,300	31,390
Isabella	16	46,613	1	7,680	39,830	30,990
Jackson	20	33,399	none	none	750	31,676
Kalamazoo	16	23,185	"	"	965	12,281
Kalkaska	16	114,943	23,759	21,635	49,614	17,727
Kent	24	51,731	471	1,000	33,566	24,588
Keweenaw	15	74,710	9,888	15,080	31,680	60,892
Lake	16	19,345	9,052	2,635	92,570	26,313
Lapeer	19	24,095	120	55	34,244	21,609
Leelanau	23	46,133	none	6,900	32,655	6,121

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† Less the township of Greenwood, from which no report could be obtained.
‡ Less the township of Grayling, from which no report could be obtained.
§ Less the township of Breitung, from which no report could be obtained.

Recapitulation by counties.—CONCLUDED.

Name of county.	Number of surveyed townships and fractions.	Number acres of standing hardwood in county.	Number acres of standing pine in county.	Number acres of standing hemlock in county.	Number acres of plains partly covered with bushes and scattering trees in county.	Number acres of swamps partly covered with small timber and bushes in county.
Lenawee	25	38,873	none	none	6,741	8,873
Livingston	16	31,496	4	"	4,246	20,876
Luce[*]	27	40,000	5,000	12,000	4,000	44,120
Mackinac	50	179,850	10,563	58,700	71,849	183,414
Macomb	14	24,738	5	none	7,200	10,642
Manistee	18	43,668	6,527	12,818	90,307	14,764
Marquette[‡]	57	269,105	85,690	90,006	240,112	180,166
Mason	16	43,746	13,912	4,360	91,522	83,397
Mecosta	16	29,869	10	13,527	66,045	18,567
Menominee	37	50,740	19,890	65,090	111,260	74,161
Midland	16	42,263	none	720	58,541	52,483
Missaukee	16	91,294	10,912	21,280	112,555	46,245
Monroe	17	31,316	none	none	5,500	8,265
Montcalm	20	20,434	120	750	82,955	20,273
Montmorency	16	58,853	12,780	15,830	166,696	41,540
Muskegon[†]	17	23,405	355	470	91,690	21,220
Newaygo	24	37,265	2,665	2,221	194,592	34,942
Oakland	25	56,544	20	none	11,289	51,825
Oceana	18	46,518	73	6,437	73,997	13,790
Ogemaw	16	54,930	3,750	6,105	93,182	18,170
Ontonagon	41	205,500	63,280	207,160	17,200	32,760
Osceola	16	56,611	1,120	12,158	56,280	20,544
Oscoda	16	45,660	21,706	4,000	204,396	23,530
Otsego	15	144,939	17,266	6,965	66,983	20,660
Ottawa	18	82,995	20	1,600	28,223	13,695
Presque Isle	23	69,606	9,086	27,981	82,261	88,897
Roscommon	16	16,145	4,920	12,440	131,160	57,265
Saginaw	25	72,531	2,108	none	52,164	56,677
Sanilac	29	9,078	10	20	54,495	62,996
Schoolcraft	37	140,459	61,367	105,218	221,960	207,263
Shiawassee	16	32,841	none	none	1,247	18,744
St. Clair	25	24,368	700	"	31,516	12,860
St. Joseph	16	21,069	none	"	1,829	9,189
Tuscola	24	36,470	105	1,420	77,713	52,368
Van Buren	18	28,355	20	none	17,811	22,647
Washtenaw	20	37,976	none	"	3,645	17,217
Wayne	21	22,262	"	"	8,188	6,686
Wexford	16	120,312	8,700	10,920	63,480	20,720
Total	1,859	6,166,977	775,208	1,468,166	5,060,810	3,265,667

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[*] Less the townships of Columbus and McMillan, from which no reports could be obtained.
[†] Less the township of Fruitport, from which no report could be obtained.
[‡] Less the township of Champion. Supervisor returned no figures.

ARBOR DAY AT THE MICHIGAN AGRICULTURAL COLLEGE.

It is the custom to observe Arbor Day at the Michigan Agricultural College. The exercises last Arbor Day were more than usually interesting and valuable. The day was perfect and a good program made the celebration a successful and long to be remembered event. At 1:30 the chapel was well filled and the audience joined heartily in singing "A Tribute to Nature." Prayer was offered by the Rev. E. B. Allen, and then President Snyder made a few well chosen remarks. Among other things he said, "Progress in one thing always comes from destruction in another. Agricultural progress has resulted in the destruction of our forests from the Atlantic to the prairies. This destruction has made reconstructive methods necessary, and so we have come to celebrate Arbor Day in order to encourage the planting of trees to replace, in a measure, what has been so wantonly destroyed." He then introduced the first speaker, the Hon. John T. Rich.

The governor spoke of the destruction of timber for the purpose of clearing farms, and of lumbering; of the resulting increase of wind storms and of the lower water level. Continuing, he said: "The forests, the water reservoirs, have been removed, our great lakes have gone down four feet; and, as a consequence, the earning capacity of our lake vessels has been decreased ten per cent. Arbor Day, if it can arrest the wanton destruction of our forests, will do much for agriculture, horticulture and navigation. Shade trees along our highways add much to the beauty of the country and to the pleasure of riding or bicycling.

Nice large buildings, yes, even whole cities and whole navies, if destroyed by fire or storm can be replaced in a comparatively short time; but one large tree destroyed can only be replaced by long years and tender care. If the next generation must have trees, this generation must plant them. One tree planted each year by each family in our state would, in a few years, make a vast difference in our roads, our school grounds and our homes."

Gov. Rich spoke without notes, and no report of his address was taken. This is to be regretted, as his entire remarks were replete with valuable suggestions, showing intelligent observation and candid thought on this important subject.

Addresses were also made by Profs. Kedzie, Beal, Crozier and Taft. They will be found interesting as coming from men who have carefully studied all phases of the forests of Michigan and who are, by their own observation, knowledge and experience, fully qualified to speak on a subject so vital to every intelligent citizen of the State.

THE EARLY FOREST OF MICHIGAN.

ARBOR DAY ADDRESS BY DR. R. C. KEDZIE.

My father brought his young family to "the Michigan" in an early period of the settlement of the territory, buying his farm of the U. S. government in 1824, and making his home on the banks of the River Raisin in 1826. It was pioneer life of the most pronounced type—not "nine miles from a lemon," but twenty-five miles from postoffice, store, mill, blacksmith, doctor—civilization. The roads were only trails through the woods, and the bridge to cross the river was a canoe, in which was ferried over the wagon, piece by piece, the grist for the family bread, and the harness, while the horses must swim. This was "going to mill" and the same process on the return trip. If the river was in flood and the mill could not be reached for a time, we sometimes made a kind of meal by planing off the corn from the ear, using a jack plane for a mill. By prolonged boiling the shavings of corn were made palatable and digestable. We had "plain living" if not the "high thinking" of Emerson.

THE LOG PALACE.

Our rustic home was built of logs, one and one-half stories high and eighteen by twenty-two on the ground. Half a dozen trees stood so near it, and of such size that if any one of them had fallen across the house it would crush it to the ground; their sheltering arms stretched over our home, but their gigantic forms suggested titanic power when once gravitation should get in its work.

THE FIRST NIGHT IN THE PALACE.

The family took possession late in the afternoon of a mild October day; the palace was not completed, the ground floor was laid, except the space reserved where the mud chimney would be built, and where a fire was burning all night to scare away wild beasts. It was literally our housewarming. Spaces had been cut in the log walls for doors and windows, but these had not been put in place, blankets being hung for door curtains, and barricades of chests and boxes to keep out intruders. Just at nightfall my brothers took the Indian pony, "Old Gray," to the bottom land to feed for the night, a small bell fastened on his neck to find him more readily in the morning, and to prevent his wandering too far his forefeet were spanceled; just as this was done, the wolves began to howl close by, and boys and pony made a bee-line for the house to tarry for the night.

Kept at a distance by the fire burning in the house the wolves howled around the house the livelong night, while the answering owls hooted from the tree tops over our heads. The terrified pony did not dare to leave the house but circled around and around it in a monotonous tramp, the thump, thump, thump, of his spanceled feet beating time to this wolf and owl duet, the tinkle of his bell serving for orchestral accompaniment.

To the small and select audience who held reserved seats, the concert still seemed somehow to lack concord and harmony of sweet sounds. There was one audience that was in no hurry to see the curtain rise.

THE SLAUGHTER OF THE MIGHTY.

The massive trees that overshadowed our house were too suggestive of crushing disaster if any one of them concluded to come down to our level. Their doom was settled because the skilled axeman could determine the direction of their fall, and thus avert danger from our home. One huge red oak was marked for slaughter and he was to die after nightfall. My father placed a lighted candle beyond the reach of the falling tree, but in the line of its fall, to see what would be the impulse given to the air by the falling mass, by the influence on the candle flame. The tree came crashing to the ground, and his windfall caused the candle flame to flicker for a moment and then go out in darkness to the intense delight of the kids. It was the first experiment in natural philosophy I ever saw. The next day a white oak four feet in diameter had to bite the dust, and we were invited outdoors to see "how it let the sky in."

The trees must fall though they held their sheltering arms over our house because danger lurked in their very shadow, and we must have breathing space and sunlight around our home. These forest monarchs with coronals of green and majesty of form appealed in vain to our sense of beauty.

"Woodman, spare that tree," was all unsung at Kedzie's Grove. The most beautiful inanimate thing God ever made is a tree, but in our eyes it "had no form or comeliness that we should desire it." It was a rival to be downed, for it held the ground we wanted for crops. "A man was famous according as he had lifted up axes upon the thick trees." The man that could chop an acre of heavy timbered land in a week commanded respect. The trees were an obstruction, an enemy to extirpate, not a thing of beauty or a friend to be cherished. It was woods, woods, everywhere; trackless, savage, terrifying. They seemed to smother us, and we gasped to drink in the open sky. Go out from our house in any direction and it was the unbroken forest for long distances; take the trail eastward and it was five miles to the first house, Richard Peters; go west and it was six miles to the house of Harvey Bliss; strike out north or south through the lonely woods, and it was twenty miles or more to a habitation, though an occasional Indian wigwam could be found. It was a forest sea, and when the wind swept through their sounding aisles it called to mind the sound of far-off waves—"deep, distant, murmuring ever more like the waters of the mighty ocean."

When we recall the fact that the woods were the home of treacherous beasts of prey, "more fierce than evening wolves," while the arm of man seemed so weak and puny before such sturdy foes, what wonder that we grew to hate a tree, and clap our hands over his downfall.

FOREST REQUIEM.

Those grand old forests! I look back with remorse upon their pitiless destruction—the rich inheritance of the centuries past, wantonly wasted. Timber to build the navies of the world, lumber to adorn the palaces of kings, were of no account in those early years. The oak trees on my father's farm were ample to build an eight-rail fence around every acre of the farm, yet burned up in log heaps. Whitewood was the only tree that had a market value, because the saw logs could be floated down the river to Monroe to be sawed into lumber. But the other trees, the oaks, ash trees, black walnut, basswood, elm, hickory and cherry, had no quotable value in those early days.

If the farms of Lenawee county were again clothed with the forests of 1826, the timber would sell for more than the farms are worth today. What is true of Lenawee is also true of all the southern tiers of counties from Lake Erie to Lake Michigan—one vast sweep of richest forests across the State, with only spots, here and there, of open prairie.

THE NORTH WOODS.

When we cross *the range* or base line of U. S. survey, and turn our gaze northward a wonderful sight meets our eyes; the pines, hemlocks and cedars, and the hardwoods of the north. I will not sing the song of the pine lest a deafening chorus should come up from every State, and from foreign shores. The pine lumber has gone everywhere to shelter, comfort and protect. During the late war I found the military hospitals on Lookout Mountain were built of pine boards from Saginaw, and the same was true all over the states scourged by civil war with its uncivil accompaniments. Michigan showed her hospitality by building hospitals in the stricken south. After the war I visited my sister in Illinois and found the buildings of the prairie state constructed of Michigan pine. The whole country has shared in the product of Michigan mills. There is no use of dwelling on this subject. "Michigan pine" comes instinctively to the lips when one talks of choice lumber in all the north and west.

But the hardwood lumber of this region stands only second to the pine. Look at the trade in hardwood lumber, and the furniture factories of Grand Rapids and other cities on our western slope. But the hardwoods themselves are disappearing so fast that a question of a future supply for those wood-devourers is being anxiously discussed at these several points. It is darkly hinted that the price of business blocks in Grand Rapids is becoming unsettled from fear of failure of this great manufacturing industry by reason of lack of raw material—the oak, maple and ash trees that once were food for log heaps, a whole burnt offering of folly!

TO MAKE A FOREST.

Did you ever stop to consider what is involved in the making of a forest, especially the element of time in raising a forest of hardwood—the growth year by year of ring after ring of compacted wood, with the exquisitely delicate coloring of every fibre? The cottonwood grows in a decade and rots in a night, but the oak is rounded and polished by a century of sunshine and storm.

The life of a tree stretches through decades into centuries. Our forests are the free-hand gift of centuries gone by—"without money and without price," like all the gifts of God. Shall we therefore quote the fool's motto, "Cost nothing, worth nothing?" Shall we waste our inheritance, and trust to the slow growth of uncounted years to make good the loss?

When a man safely passes some critical point, we say he is "out of the woods;" but when Michigan is *"out of the woods,"* the critical point will only be reached.

THE BURGUNDIAN RULE.

The forest as such yields no adequate support for a dense population—one person to a township. It was necesary that some of the woods should be cleared off to make room for civilized life; grain must replace game.

The rule of the Duke of Burgundy, now generally accepted in Europe, in regard to the safe limit of cultivated soil to forests, is "One-third for the huntsman and two-thirds for the husbandman." Or "One-third for nature, two-thirds for man." The relation of forest to field as influencing climate and production, the equalizing of temperature and the conservation of moisture are matters demanding careful study. Have we reached that limit even in the naturally forested regions lying east of the Mississippi river?

A BALANCE WHEEL.

Forests are the balance wheel of climate. After water, there is no such equalizer of climatic extremes, of parching heat and piercing cold, the distribution of rain and conservation of water, and a bridle upon the rustling winds. Where the proper balance is maintained between forest and field, the life-sustaining capacity of a state is greater than when the whole surface is laid bare to the plow and turned up to the blistering sunbeams. Health is stronger, food is better and life is sweeter under the sheltering arms of *the brave old oak.*

WHAT NOW SHALL BE DONE WITH OUR FORESTS?

ARBOR DAY ADDRESS BY DR. W. J. BEAL.

The celebration of Arbor Day did not originate in a state naturally covered with a fine forest, but in a prairie country. It started in Nebraska, in 1872, twenty-four years ago, through the efforts of Hon. J. Sterling Morton, now Secretary of Agriculture; and on that day in the state named, over 12,000,000 trees were planted.

In the past, two or three or more Arbor Days have been observed at M. A. C.

Michigan has a mild climate, tempered by the great lakes; and it is natural for trees to grow in such countries. We have just heard of the magnificent virgin forests of the State—trees were so abundant that they were a hindrance to the early settlers. Until very recently, it was next to impossible to find many persons who were willing to admit that Michigan pine was nearly gone.

We have also heard a candid statement of the present condition of our forests, to the effect that the State has but little pine left and the hardwood, or more properly speaking, the broad-leaved trees, are going at a more rapid rate than did the pine. As the timber dimishes, the demand increases.

Our forests have been treated much as a mine is treated, viz., cut over with the view of exhaustion and extermination.

In my opinion, large areas in many portions of the State are better adapted to growing forests trees than anything else.

We do not need to trouble ourselves about replanting much of this land, but only take a little care and kind nature will do the rest. Even this beautiful campus would soon be a dense forest if left to nature.

At about twenty institutes and other gatherings the past winter, I have presented this subject and do not propose letting the matter drop for a good while yet.

Our good governor is interested in this important subject and is doing much to educate the people in the needs of forestry.

Of all the products of these United States that come from the soil, one-third or nearly that, is derived from the forests where man cuts and removes what no man planted or cultivated. In our own State the relative value of the timber to the farm crops is even greater than the average in the whole United States.

Considering its very great importance, Michigan is not doing as much in the interest of forestry as she is in protecting the fishes of the lakes and streams. There is less interest manifested in the proper management of our native trees than in the protection of game, birds and beasts.

Different portions of our State have suffered enormously by devastating fires. Perhaps the sooner we have more severe and extensive fires the sooner we shall be aroused to action.

In 1894 the state of Wisconsin estimated her loss by forest fires at $5,000,000, and suffering people were assisted to the extent of $2,500,000, making $7,500,000.

In the same year the state of Minnesota estimated her loss by forest fires at not less than $12,000,000. In both these states it is safe to double the amounts named as more nearly the actual loss, because the fires destroyed immense groves of young trees with a great prospective value; besides no estimate was made for the fearful loss of vegetable matter which was burned, in many places leaving the soil in poor condition.

The people of Wisconsin and Minnesota have suffered long enough these fearful inroads by forest fires, and over a year ago set us a good example by appropriating money to carry out provisions of wise legislation.

Some years ago I expressed surprise to a citizen of Minnesota, that so young a state should make an annual appropriation of $200,000 for the support of her university. How did you bring it about? Oh! we appealed to state pride, and told our people to see what Michigan had done for the cause of education. That appeal brought the money so much needed.

What shall we do or what should the citizens all over Michigan attempt in the interest of forestry?

1. Let us appeal to State pride. See what Wisconsin and Minnesota have done in attempting to save some of the young trees of their remaining forests.

Taxes may be burdensome, but when it looks as though a little money judiciously spent in caring for the forests of the State, would return or give to the State 50 to 100 times its value, it is folly to withhold a small tax.

2. By all honorable means, attempt to arouse an interest in the subject. No doubt it would be easier to interest farmers had we been favored with much less timber when the State was new. Our timber then would have been more highly appreciated.

3. Let us work for the organization of a State forest commission, or some other association with money to support it well. Such a great work in various parts of our State needs a head to manage it. What can such a commission accomplish?

a. It could begin in the older portions of our State by carrying out a good suggestion of our governor, viz.: That we cannot grow a good crop of timber and at the same time raise feed for cattle on the same land. Live stock of all kinds should be kept out of the woods if the farmer has any regard for the future welfare of his wood lot.

b. In the newer portions of the State, especially where pines and other cone bearing trees grow well, persistent efforts should be made to induce the clearing up of tops, and refuse timber, that the rubbish be not left till dry as tinder, to burn everything clean within its reach. This will prove no easy task, for the owners will claim that it is impossible and too costly. They want to be left alone, to get what they can, and leave the neighborhood to look out for itself. Back fire strips or roads in time of safety from fire.

c. Experience in many states has demonstrated that forest fires cannot be properly looked after without a well organized system of fire wardens. A forest commission with fire wardens is no longer an experiment. Its efficiency has been well shown in many countries.

d. Such a commission could see to it that the subject was properly presented at every farmers' institute in the State, for some time to come.

e. A commision would keep the subject before the country schools of our State. Prizes would be offered for the best essays bearing on topics pertaining to our forests. The proper celebration of Arbor Day would be encouraged.

f. Numerous notices for the press of the State would be prepared, bulletins issued and sent to those interested, or to those who should be interested.

g. The commission could encourage the location of numerous forest reserves about lakes, the sources of streams, and other suitable places. Large quantities of stump lands which have reverted to the State for taxes are now in many instances burned over every year or two, and are becoming less and less valuable. A commission would most likely be able to prevent most of these fires and leave the lands to increase in value by growing trees.

h. Among other things, perhaps an energetic forest commission might induce the Agricultural College to introduce a short course, or a long course, on the subject of forestry and in the same connection create a demand for men educated in these lines. Young men here stand ready to pursue such a course just as soon as they can see money at the end of it.

In this connection, it may be well to call attention to the fact that M. A. C. is doing something to improve her forests.

Intimately connected with this subject is the increase in numbers and good management of parks in the vicinity of every city and town, the improvement of highways by constructing a good roadbed and by looking well to the trees, shrubs, and other objects along the road side. In the same connection, permit me to call attention to the importance of improvements in planting and management of rural cemeteries. And finally, as our native trees and shrubs disappear, as the thickets are browsed by cattle, or killed by fires, as our swamps are ditched and plowed or burned over, a larger proportion of the most intelligent population exhibit a lively interest in forests and their care. No agricultural student of this college should be permitted to get far into his course without having his attention forcibly called to some of the most important problems connected with the forests of the State and nation.

MICHIGAN FORESTS OF TODAY.

ARBOR DAY ADDRESS BY A. A. CROZIER.

I happen to have been born and brought up in the backwoods of western Michigan, in a place which, for that part of the State, was the dividing line between the hardwoods and the pine. North, as far as the eye could see, was the pine, a large block of which still remained within my recollection like a great cloud upon the horizon. Southward to the opposite horizon were rolling hills of beech and maple. During my college course I taught school one winter in the northern lumber woods, where all night long could be heard the rumble of loaded tram cars carrying logs to the Little Muskegon river. If there has been one thing impressed upon my mind more than another it has been the vast supply of Michigan pine.

During the past two winters, while attending farmers' institutes, I have had an opportunity to see something of the effect that continued lumbering has had on this supply of pine. And I think some of you will be as surprised as I was when I say that in traveling nearly two thousand miles through some forty counties in the lumber regions of the State, I cannot now recall having seen in any one place as much as a single acre of standing white pine in good condition. Of course, these travels were mainly along the railroads, where as along the streams, the timber is first cut away; but when one can ride through the heart of the pine country from Manistee on the west to Saginaw on the east, and see an almost continuous succession of abandoned lumber fields, miles upon miles of stumps as far as the eye can see, it has some significance. We know there still remain in northern Michigan swamps filled with hemlock, cedar, and other less valuable timber, some excellent belts of hardwood, which are being fast cut away, and here and there remote from the rivers and main lines of railroad a few considerable blocks of good white pine still held by speculators or now being cut and removed by means of spurs of the railroads branching out from the main lines. But the impression which I think any one would get from traveling through the State, and which all the evidence goes to show is correct, is that the important lumbering days of Michigan are past. Considerable lumber of one kind and another is still being cut, owing to the advance in price, bringing into market timber of poorer quality and from more remote localities, but this work is now being done more and more in a small way. The larger operators have many of them gone out of business or have shifted the scene of their operations to the forests of the Southern States or the Pacific Northwest.

Last summer an incident occurred here at the college which served to illustrate to one who does not keep posted on such matters something of the changes which have taken place in the Michigan lumber trade within the past few years. The college had occasion to build another barn, and in the bill of lumber was an order for some 18 foot white pine barn boards, such as were used in building the other barns upon the grounds. The dealer examined the bill with some astonishment and said that if we really wanted such lumber he would endeavor to get it for us somewhere in the State, but that it might have to be sawed on a special order. Such lumber was not kept in stock in Lansing, and had not been for several years. People had entirely given up using such expensive lumber as good white pine for building barns. And so, gathering wisdom as we went along, the barn was built with hemlock for joists, studding, and siding, and with yellow pine from Arkansas for flooring. One thing the builder insisted on was a good old fashioned two-inch white pine floor for a driveway and threshing floor. Yes, the dealer had just what was wanted, some choice six inch plank that had been on hand for several years. White pine it certainly proved to be, but full of knots, having apparently all been cut from trees not over eight or ten inches in diameter.

I have tried to get figures to show how much cleared land there is at present in the State and how much in original forests, but statistics do not appear to give just this information. The State census of 1894, not yet fully published, gives the number of acres in farms in the State at 15,296,078, or 42 per cent of the total land area. Of this amount, 10,379,515 acres, or about two-thirds, are improved, making the land actually under cultivation in the State about 28 per cent of the whole. Nothing is said of the condition of the more than half of the State's surface not in farms, but still belonging to the State or to the railroads or other large corporations or wealthy individuals. These lands, while none of them are reported as improved, have, as we know, been extensively cut over for lumber, and large sections can no longer be properly classed as forests.

The distribution of the cultivated land is of course very unequal throughout the State. In the southern four tiers of counties, which include about one-third of the area of the State, the amount of improved land is 67 per cent of the whole, while in the Upper Peninsula, which also comprises about one-third of the State, the land under cultivation is only 1½ per cent of the whole. The vast areas of uncultivated land denuded of timber which are found in the northern half of the State do not exist at the south. There is at the south less land which is neither farm nor forest. The condition, however, of much of the woodland in the southern part of the State deserves to be noted. Though evidently reserved in most cases for permanent forest, the treatment it had received has often been such as to unfit it for that purpose. Fire has done less damage in the south than in the north, owing mainly to the limited extent and isolated situation of the wooded sections, but live stock has here done much greater injury. In the thickly settled southern counties there is a demand for all the pasturage that can be obtained, and it is probably true that fully half of the woodland in that section of the State is habitually used for pasture, with the result that all the smaller growth gradually disappears, thus limiting the duration of a forest so treated to the life of the larger timber. In the southern counties we see then that the cultivated land has already reached two-thirds of the whole, which is about equal to that of Germany and some of the other countries of Europe. In northern Michigan the area of cultivated land is still small, but a large portion of the remaining surface has been lumbered over and is now lying idle, awaiting settlement, or possibly in some cases reforestation, but at present yielding no valuable returns to any one.

ARBOR DRY ON THE FARM.

ARBOR DAY ADDRESS BY PROF. L. R. TAFT.

In the last issue of the Youth's Companion there was a short article by the Father of Arbor Day, Secretary J. Sterling Morton, which was substantially as follows:

In January, 1872, J. Sterling Morton introduced a resolution at a meeting of the State Board of Agriculture of Nebraska, setting apart and consecrating one day in the month of April for tree planting, and naming it "Arbor Day." In 1874 Gov. Furnas, of Nebraska, issued the first Arbor Day proclamation, and, a few years later, the day was made a legal holiday in that State.

So far as I have been able to learn, Michigan was the second State to fall into line, as Gov. Bagley, February 22, 1876, appointed April 15 as "Arbor Day" for that year, while Wisconsin, under the auspices of the State Forestry Association, held its firtst Arbor Day on the 18th of May of that year, and as a result 1,342,886 trees were planted in that State. The idea was soon taken up by other states, particularly at the west, until now forty-two of the forty-five states of the Union celebrate "Arbor Day," as do Canada, Mexico, Great Britain, and India.

It is reported that upon the first Arbor day in Nebraska 12,000,000 trees were planted. The benefits of these earlier plantings became so marked that up to 1888 more than two and one-half billion trees were planted in that State upon homestead and tree claims, and in all up to the present time over twenty billion trees have been planted in Nebraska upon "Arbor Days."

In his article in the Youth's Companion, Secretary Morton states that more than 25,000 acres of forests are consumed each twenty-four hours by railroads, manufactories and forest fires, and he very pertinently asks, "How many acres are planted every twenty-four hours?" and, "How long, at the present rate of consumption, before the primeval forests of the United States shall have become completely denuded?"

In considering the division of the topic that has been assigned to me, the celebration of "Arbor Day on the Farm," it very naturally divides itself into planting a forest, setting out fruit and nut trees, decorating the grounds about the house, and roadside planting.

From what has been said by previous speakers regarding the present condition of Michigan forests, which, however depleted, compare favorably with those of most other states, it can be seen that the farmer who has waste land adapted to the purpose, will find the planting of it to timber trees a profitable investment. Such a timber plantation will have at least a threefold value. In sections of the State where most of the land has been cleared, not the least to be considered is the beneficient effect of a forest as a windbreak. Even though one does not care to plant extensively for timber purposes, in sections where the wind has unrestricted sweep, a shelter belt of evergreens of but a few rods in width will have a marked effect in tempering the blasts of winter. No one will dispute the value of the shelter belt, so far as the protection of the dwelling and stables is concerned, and its importance, and I might say its necessity, for the best success in gardening and fruit culture are beginning to be appreciated by all intelligent persons.

To secure any marked effect upon the general climate of a section will require concerted action and extensive planting over large areas, and it will require many years for the trees to grow to a size sufficient to have any great influence, but with the increasing interest in forest preservation and in reforestation, even this can be hoped for in the future.

Aside from their value as windbreaks, timber belts are of value on the farm for furnishing a supply of stove wood for family use or for sale. While most farmers have retained wood lots of ample size to supply their needs, we frequently find that although it would have been of more income had it been left in forest, all of the land upon a farm has been cleared.

In case any of the land is rough and uneven, or for any other reason is not adapted for profitable cropping, it may be planted to such trees as are suited to the soil and climate, and after the first five years the necessary thinning out of the plantation will supply stove wood for a family from each five acres. If a proper selection of varieties has been planted, it will be only a few years before a large annual return can be obtained from the trees, as many of them can be used for fence and telephone posts, while others can be allowed to grow up into timber.

Instead of devoting Arbor Day to the planting of forest trees, it may be used in planting orchards of fruit trees, either for home use or market. Every farm should have, within a short distance of the house, a variety of the different kinds of fruits adapted to home use.

While in the case of an orchard designed strictly for commercial purposes, great care should be taken that it be located where it will have congenial surroundings, and where the arrangements are such that it can have proper care and attention, with the greatest economy of labor. It is often the case that there is a part of the farm where it is impossible to grow the ordinary farm crops to advantage, but which can be utilized for a few fruit trees. In this way not only can the waste land be utilized but an unsightly place can be concealed. This practice is not to be commended, except where the land is adapted to the kind of fruit to be planted, and where there is a supply of plant food and water for the trees. Upon most land there is an opportunity for such use of the land and the planting of such places would be an excellent work for Arbor Day.

In addition to the planting of fruit trees in such locations, the matter of using the various nut trees should have consideration. In many sections of southern Michigan, the chestnut can be grown to advantage. While the common sweet chestnut is capable of being grown with profit, the Paragon and the various European and Japaneses varieties, although inferior in quality, are even more promising, as the fruit is much larger, and the trees are early and abundant bearers. This fruit will adapt itself to locations and conditions in which very few of the fruits would succeed. While they would be benefited by an occasional cultivation for the first few years, fair success can be obtained without it if the soil is suitable. The chestnut is a very common forest tree in parts of New

England and thrives best in a sandy loam soil. A limestone soil is thought to be uncongenial to them.

Although not likely to be commonly successful, some of the pecans, and of the hardier, late blooming varieties of the English, or more properly the Persian walnut, may be found to do well in some of the sheltered places along the shore of Lake Michigan. The filbert is another fruit whose value is worthy of investigation.

The various nut trees can all be grown from seed, but if the best fruit is desired, grafted trees of improved varieties can be obtained from nurserymen. The importance of nut culture as an industry can be seen when it is stated that from $150,000 to $200,000 worth of nuts are brought into Michigan annually, an amount larger than would be produced by 10,000 acres of good land in wheat. Since soils that are but poorly adapted to wheat and other farm crops can be used for the growing of nut trees, here again would seem to be an admirable way of spending Arbor Day.

In addition to their value from a standpoint of dollars and cents, a grove of nut trees would add much to the attractiveness of a farm, and besides would make an excellent windbreak. Surmounting an eminence as it often would, its value in enhancing the worth of the farm, and the pleasure afforded the æsthetic taste of its occupants, would repay its entire cost.

Roadside planting should also receive attention, making use so far as possible of native trees and shrubs. In some sections, fruit and nut trees can be used for this purpose, and would be well adapted almost everywhere were it not for the fact that the ruthless poacher is not content with stealing the fruit, but strips the branches, knocks off the bark and ruins the trees, both as objects of beauty, and so far as the production of future crops is concerned.

In some sections of Europe the cherry is used as a street tree, and particularly while in flower and fruit presents an appearance equalled by none of our ornamental trees, so called.

While Arbor Day in its original significance dealt largely with forest planting, it is today viewed rather more from the æsthetic and ornamental, rather than from the commercial side, and the planting that is done in Michigan is largely about the dwelling and along the roadside. Our people seem to be too much engaged in the destruction of forests to give much attention to reforestation, although there has been a marked change in its favor during the past ten years. But the value of trees about the dwelling is appreciated by all. A proper selection of trees, nicely arranged about the house, will not only afford shade, and when necessary a windbreak, but they relieve the bareness that is so noticeable when trees are not used, and aside from the beauty of the individual trees in form, habit, foliage and flower, they all blend together into a beautiful picture. The results of many of the attempts at landscape decoration are not altogether satisfactory, and we may attribute the failures to a variety of causes. Among them we may note: the selection of varieties that are not adapted to the soil or location; mutilation of the roots in digging or want of proper care in planting; injury from borers or other insects, and lack of moisture and plant food, due to the dry season or because they have been allowed to grow in grass without proper care and cultivation.

Even though the trees may live and flourish so far as growth is concerned, the effect is not always what could be desired. For this various reasons may be given. Much of it is due to the common desire on the part of the planter to scatter the trees about wherever there is an available spot, "on the dot a tree everywhere" plan. On the other hand we should endeavor to leave considerable patches of lawn unbroken and arrange the trees more or less in groups along the sides and in front of the lot with just enough trees about the house to give some shade to the ground around, without shading the house at most more than one-third of the time.

It is difficult at the time of planting to imagine that the little sapling will grow into the mighty elm, oak or maple, and this often leads to the planting of the trees so thickly that the view to and from the house is cut off. In locating the groups we should always endeavor to avoid this.

We can wisely make increased use of the shrubbery and vines about the house, and all can be brightened with bedding plants, but as with the trees, care should be taken not to unduly break up the lawn.

Another excellent use of Arbor Day is the cleaning up and picking up of the grounds about the house and other buildings. This not only adds to the looks but it gives an appearance of thrift and has often been found to pay in various ways from a financial standpoint. When the yard is strewn with bits of board, papers and discarded tools, or worse yet, new plows, wagons and binders, the effect upon children cannot be good, while a neatly kept yard will aid in instilling habits and ideas of neatness.

A writer has said, "The nakedness of farm homes, and the utter absence of the ornamental, tells of a sad defect in the early education." He advises that the work of ornamentation be commenced with the school grounds. "Make them beautiful and you will not only create an attachment for the school, but the children will soon demand that their homes shall be beautiful as well as the school grounds."

Here then is another use for Arbor Day, as much of the work of ornamenting the grounds will be too heavy for the children. If the patrons of the school will aid in preparing the lawn, and in building walks and fences, and perhaps in obtaining trees and shrubs, the work of planting and caring for them can be done by the children under the direction of the teacher.

Lowell has said, "No man does anything more visibly useful to posterity than he who plants a tree," and while this may seem but a slight inducement to the selfish man, it is difficult to see how any one can forego doing what cannot fail to give immediate and lasting pleasure to one's self and family. To all then I would urge what Secretary Morton calls his decalogue: "Plant trees," as

"Who sows a field or trains a flower
Or plants a tree is more than all,
For he who blesses most is blest."

PRESERVATION OF FORESTS IN OTHER STATES.

Many states have laws looking to the preservation of forests by the appointment of "Fire Wardens." Space forbids the publication of more than one of these laws. That of Minnesota seems to come nearer to our wants in Michigan than any other, and is published in full. With only a limited experience under this law the chief fire warden in his annual report acknowledges very much benefit at a very limited expense.

There is no question that Michigan should take immediate steps to preserve her forests from wanton destruction by fire or any other means which can be prevented.

THE MINNESOTA LAW.

AN ACT to provide for the preservation of forests of this state and for the prevention and suppression of forest and prairie fires.

Be it enacted by the Legislature of the State of Minnesota:

SECTION 1. The State Auditor shall be Forest Commissioner of this state and his orders shall be supreme in all matters relating to the preservation of the forests of this state and to the prevention and suppression of forest and prairie fires as hereinafter provided. The supervisors of towns, mayors of cities and presidents of village councils are hereby constituted fire wardens of their respective towns, cities and villages in the state and the Chief Fire Warden may appoint as fire wardens such other persons as he may deem necessary living in or near to unorganized territory in this state, whose districts, to be known as fire districts, he may determine.

SEC. 2. The aforesaid Forest Commissioner shall appoint a competent deputy to be known as Chief Fire Warden, who, from personal experience, is familiar with the conditions of the forest and methods by which fires may be controlled. Said Chief Fire Warden shall receive a salary of twelve hundred ($1,200) dollars per year, and shall hold his office during the pleasure of the Forest Commissioner. He shall represent the authority of the Forest Commissioner and it shall be his duty to enforce the provisions of this act throughout the state.

SEC. 3. The Chief Fire Warden shall have general charge of the fire warden force of the state and shall have authority to mass such fire warden force as may be available at any special point to suppress fires. In case the fire warden force of any locality is deemed by said Chief Fire Warden inadequate to prevent or suppress forest or prairie fires, he may appoint, temporarily, needed fire wardens whose duties and authority shall be the same as herein given to town supervisors acting as fire wardens. He shall properly divide into fire districts all unorganized territory in this state and appoint competent fire wardens therein; he shall coöperate with any police or military force of the United States Government which may be detailed to guard the national domain from fire; he shall investigate the extent of the forests in the state, together with the amounts and varieties of the wood and timber growing therein, the damages done to them from time to time by forest fires and the causes of such fires, the method used, if any, to promote the regrowth of timber, and any other important facts relating to forest interests, which may be required by the Forest Commissioner. The information so gathered, with his suggestions relative thereto, shall be included in a report to be made by him annually to the Forest Commissioner.

SEC. 4. The Forest Commissioner shall provide and officially sign an abstract of the penal laws of this act, with such rules and regulations in accord therewith as he may deem necessary, and on or before the first day of April of each year he shall forward as many copies as he considers needful to the chairman of each town board of supervisors and presidents of villages, to the forest fire wardens that he has appointed and to all railroad companies and to the chairman of each board of county commissioners in this state, and it shall be the duty of said fire wardens to post up such abstract as warning placards in conspicuous places in their respective districts, and it shall be the duty of the county commissioners of each county to cause the said abstract to be published in at least three issues of the official paper in their respective counties during the fire-dangerous season of each year, which shall be reckoned from the 15th of April to the 1st of November.

SEC. 5. During a dry and dangerous season, when forest and prairie fires are prevailing or are liable to break out, the Chief Fire Warden shall use such means under his command as he may deem necessary to prevent or suppress such fires, and his expenses shall be paid by the state, which expenditures in one year shall not exceed five thousand dollars to be paid for out of the general revenue fund, upon the order of the Forest Commissioner.

SEC. 6. It shall be the duty of each fire warden to take precautions to prevent the setting of forest or prairie fires, and when his district is suffering or threatened with fire, to go to the place of danger to control such fires, and each forest fire warden shall have authority to call to his assistance in emergencies any able-bodied male person over eighteen years of age, and if any such person refuses, without reasonable justification or excuse, to assist, or if any fire warden refuses or neglects to perform the duties assigned him in this act, such officer or person shall be deemed guilty of a misdemeanor, and shall upon conviction thereof be punished by a fine of not more than one hundred ($100) dollars or imprisonment in the county jail not to exceed three (3) months.

SEC. 7. The Chief Fire Warden and the several fire wardens created by this act shall have authority to enforce the provisions of this act, and it shall be their duty to coöperate with the fire warden of any adjoining district, and in the absence of such fire wardens to direct the work of control and extinguishment of forest or prairie fires in such district, and to arrest, without warrant, every person found violating the provisions of this act, and to forthwith take the offender before a magistrate and make complaint against such person. The chairman of boards of township supervisors, presidents of villages and fire wardens appointed by the Chief Fire Warden shall inquire into the cause of each forest or prairie fire within their districts and shall report the same to the Chief Fire Warden and the methods used to control or extinguish such fires and the amount of property destroyed and the number of lives lost, if any, and report such other facts in regard to said fires as said Chief Fire Warden may require. During the more dangerous season of the year the Chief Fire Warden may require frequent reports from the chairmen of township boards, or in unorganized towns from fire wardens appointed by the said Chief Fire Warden, as to condition of forest and prairie fires and as to what is being done to control the same.

SEC. 8. Each fire warden shall receive for his actual services rendered under this act two ($2) dollars per day, two-thirds of which shall be paid by the county where such service is perfomed, and one-third by the state; and any employé engaged in like service shall receive at the rate of one and fifty one-hundredths ($1.50) dollars per day, and said expense shall also be paid, two-thirds by the county where such service is rendered, and one-third by the state, as hereinafter provided, but no payment shall be made to any claimant under this act until he shall have presented an itemized account and made oath or affirmation that said account is just and correct, which account shall be approved by the board of township supervisors, and shall be audited by the county commissioners, when satisfied of the justice of the claim, and left on file with the county auditor; in case of unorganized townships, the board of county commissioner alone shall approve and audit such accounts. The county auditor shall thereupon issue to each claimant his warrant upon the county treasurer for the entire sum to which such claimant is entitled, and the treasurer shall pay the same. Such county auditor shall transmit the original oath and copy of the warrant to the State Auditor, who shall audit such claim, and one-third thereof shall be paid out of the state treasury from the general revenue fund by warrant issued by the State Auditor upon the State Treasurer in favor of the county thereof paying the same, and forward the same to the auditor of said county. Provided, that no fire warden shall be paid, in any one year, for more than ten (10) days' service in extinguishment and preventing forest or prairie fires, nor for more than five (5) days' service in each year in posting notices and making the reports required by this act; nor, in the aggregate, for more than fifteen (15) days' service, of whatever character, in any one year; nor shall any one person, employed by fire wardens to assist in extinguishing or preventing forest or prairie fires be paid for more than five (5) days of such service in any one year. No county shall expend more than five hundred ($500) dollars of public money in any one year under this act.

Sec. 9. Any person who willfully, negligently or carelessly sets on fire, or causes to be set on fire, any woods, prairie or other combustible material, whether or not on his own lands, by means whereof the property of another is injured or endangered, or any person who willfully, negligently or carelessly suffers any fire set by himself to damage the property of another, is guilty of a misdemeanor and shall be punished by a fine not exceeding one hundred ($100) dollars, or by imprisonment in the county jail not exceeding three (3) months. Any person who maliciously sets on fire, or causes to be set on fire, any woods, prairies or other combustible material whereby the property of another is destroyed and life is sacrificed, shall be punished with a fine of not over five hundred ($500) dollars, or be imprisoned in the state prison for a term of not over ten (10) years, or both such fine and imprisonment.

Sec. 10. Any person who shall kindle a fire on or dangerously near to forest or prairie land and leave it unquenched, or shall be a party thereto, and every person who shall use other than incombustible wads for firearms, or who shall carry a naked torch, fire brand or other exposed light in or dangerously near to forest land, causing risk of accidental fire, shall be punished by a fine not exceeding one hundred ($100) dollars or imprisonment in the county jail not exceeding three (3) months.

Sec. 11. Every person who shall willfully or heedlessly deface, destroy or remove any warning placard posted under the requirements of this act shall be liable to a fine not exceeding one hundred ($100) dollars for each such offense, or imprisonment in the county jail not exceeding three (3) months.

Sec. 12. It shall be the duty of all railroad companies operating any railroad within this state to use efficient spark arresters on all their engines and to keep their right of way to the width of fifty (50) feet on each side of the center of the main track cleared of all combustible materials and safely dispose of the same within said limits of their right of way between the fifteenth day of April and the first day of December. No railroad company shall permit its empployés to leave a deposit of fire or live coals, or hot ashes, in the immediate vicinity of woodland, or lands liable to be overrun by fires, and where engineers, conductors or trainmen discover that fences or other materials along the right of way or woodland adjacent to the railroad are burning or in danger from fire, they shall report the same promptly at the next telegraph station that they may pass. In seasons of drouth railroad companies shall give particular instructions to their employés for the prevention and prompt extinguishment of fires and they shall cause warning placards furnished by the Forest Commissioner to be posted at their stations in the vicinity of forest and prairie grass lands, and where a fire occurs along the line of their road they shall concentrate such help and adopt such measures as shall be available to effectively extinguish it. Any railroad company willfully violating the requirements of this act shall be deemed guilty of a misdemeanor and be punished by a fine not exceeding one hundred ($100) dollars for each such offense, and railroad employés willfully violating the requirements of this section shall be guilty of a misdemeanor and be punished by a fine of not less than five ($5) dollars nor more than fifty ($50) dollars. But this section shall not be construed to prohibit or prevent any railroad company from piling or keeping upon the right of way cross ties or other material necessary in the operation or maintenance of such railroad.

Sec. 13. It shall be the duty of each and every owner of threshing or other portable steam engines to have efficient spark arresters on their engines at all times when in use, and no person in charge of any threshing engine shall deposit live coals or hot ashes from his engine in any place without putting them out or covering them with at least three inches of earth before leaving them. All persons violating the provisions of this section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not less than five ($5) dollars nor more than fifty ($50) dollars.

SEC. 14. Nothing in this act shall be construed as affecting any right of action for damages.

SEC. 15. Woodland territory within the terms of this act shall be construed to mean bodies of forest and brush land.

SEC. 16. All moneys received as penalties for violating the provisions of this act shall be paid into the county treasury of the county wherein the offense occurred, to be known as the County Fire Fund, and used under the direction of the county board in defraying the expenses of enforcing the provisions of this act within such county.

SEC. 17. The Forest Commissioner shall annually on or before the first day of December make a written report to the Governor of his doings in respect to the duties herein assigned him, together with an itemized account of the expenses incurred in carrying out the provisions of this act, which report shall include such statistics and facts as he has obtained from the Chief Fire Warden and from the several fire wardens of the state and from other sources, together with his suggestions relative to the preservation of the forests of the state and to the prevention and extinguishment of forest and prairie fires.

SEC. 18. All acts and parts of acts inconsistent with this act are hereby repealed.

SEC. 19. This act shall take effect and be in force from and after its passage.

Approved April 18, 1895.

RAILROAD LAND GRANTS.

In an early day in the history of Michigan grants of land aggregating several hundred thousand acres, mostly timbered, were made by the government to aid in the construction of railroads in the State. At this time many unemployed men are looking to the country for cheap homes, and the means of making a living for themselves and families. With a view of furnishing information on this matter, several of these railroad companies still owning lands were invited to furnish a brief statement of their lands, covering location, terms of sale and number of acres still held.

The Jackson, Lansing & Saginaw, Flint & Pere Marquette, Grand Rapids & Indiana, and the Detroit, Mackinac & Marquette companies complied. Their communications are given a place here and may be a benefit to persons looking for cheap homes:

JACKSON, LANSING & SAGINAW RAILROAD CO.

LANSING, MICH., *September 14, 1896.*

HON. C. H. MORSE, *Commissioner of Labor, Lansing, Mich.:*

DEAR SIR—I am in receipt of your valued favor asking this company to furnish you with statistics relative to its land grant and I cheerfully comply with your request and submit the following:

Up to this time there have been patented to this company by the general government upwards of 590,000 acres, and of this amount the company has sold 365,000 acres, there being a balance now remaining of 225,000 acres. The lands of this company are principally situated in the counties of Saginaw, Bay, Ogemaw, Roscommon, Missaukee, Kalkaska, Crawford, Otsego, Antrim, Charlevoix, Cheboygan, and other counties, thus affording a wide range in choice locations. They are to be found upon odd numbered sections and embrace every variety of soil and timber.

The Mackinac division of the Michigan Central railroad passes directly through the grant and the lands are situated on each side of it. The Grand Rapids & Indiana railroad also extends along the west side of the grant and through the midst of the lands in the northern counties. Portions of them are situated near the waters of Lake Michigan, others near Lake Huron and Saginaw Bay. All are within easy access of these waters. The great lumbering streams of the State, the Rifle, the Muskegon, the Au Sable, the Manistee, the Cheboygan, the Pigeon, and the Black rivers also traverse this district and afford ready and cheap transportation for timber found here in abundance.

The lands now remaining may be classified as follows: 125,000 acres of hardwood, 20,000 acres of cedar and other valuable timbers, 40,000 acres of hardwood lands from which the scattering pine timber has been sold, 40,000 acres of "plains."

The prices of these lands vary from $1.25 per acre for the plains land to $7.50 per acre for the hardwood land. The terms of sale are one-half the purchase price in cash and the balance in three equal annual payments with interest.

The lands timbered with beech, maple, basswood, hemlock, ash and bird's eye maple are fertile and well adapted to farming. All the timber on hardwood land is now valuable, the bird's eye maple especially so, and it is found in large quantities on the lands of this company. All these hardwood lands are of the best quality and the counties in which they are located are already well settled and supplied with good roads, churches, school-houses and the necessary comforts of life. The "plains" lands are quite free from timber and are nearly ready for the plow. Though these "plains" are now offered at low prices, they possess the same qualities of soil as many of the best lands of New England. Wherever lands of this kind have been subjected to an intelligent husbandry, adapted to their character, they have produced well.

I trust I have answered fully in regard to our lands, but shall be glad indeed to comply with other requests from your department, or answer directly any communications you may refer to us concerning Northern Michigan lands.

Very truly, etc.,
O. M. Barnes,
Land Commissioner.

Lansing, Mich.

FLINT & PERE MARQUETTE RAILROAD LANDS.

Saginaw, Mich., *September 15, 1896.*

Hon. C. H. Morse, *Commissioner of Labor, Lansing, Mich.:*

Dear Sir—The Flint & Pere Marquette Railroad Company offers for sale, through its land department, the unsold lands granted by congress to aid in the construction of its railroad. These lands lie on both sides of the line of the railroad west of Saginaw.

The company has yet unsold: In the county of Saginaw, about 160 acres; Gratiot, 520; Midland, 2,400; Gladwin, 80; Isabella, 940; Clare, 1,200; Mecosta, 2,800; Osceola, 3,000; Newaygo, 2,400; Lake, 18,500, Oceana, 1,200; Mason, 16,500.

By reference to the map it will be seen that these lands lie in the central portion of the lower peninsula, between Saginaw Bay and Lake Michigan. The country is well watered by numerous streams forming tributaries to the Tittabawassee, Muskegon, Pere Marquette and Manistee rivers, and many of the streams are well stocked with brook trout and other fish.

From Saginaw, westerly, the surface of the country rises above the waters of Lake Huron as follows: At Coleman's Station, 185 feet; Farwell, 345 feet; Lake, 495 feet; Evart, 421 feet; Reed City, 455 feet; the summit near Chase, 621 feet. Falling thence toward Lake Michigan: At Baldwin, 253 feet; Scottville, 103 feet, reaching Ludington at a level substantially the same as at Saginaw.

On account of the elevation above the lakes, the people of this portion of the State are not afflicted with malarial diseases, the air is pure and the climate exceedingly healthy.

The lands are comparatively level, but with a surface sufficiently rolling to ensure good drainage, and are mainly timbered with beech, maple, hemlock, lynn, elm, ash, cedar, etc. The pine lands formerly owned by this company have all been sold. The soil is variable. In some localities it is sandy; in others it is a gravelly loam; in others is sandy, with clay subsoil, and in some places there is a clay soil.

More than one-third of these lands are located in Mason and Oceana counties, which are within *the celebrated fruit belt of Michigan.* Fruit raising has been thoroughly tested, and peaches, plums, pears and apples are grown in great quantities, with large profits therefrom to the producer, all the surplus product being shipped to Chicago and Milwaukee via the daily line of steamers of the F. & P. M. R. R. Co. and by other lines.

The settlement along the line of the F. & P. M. R. R. has been very rapid, with churches and school-houses in the townships, villages and cities along the line and the country possesses all the advantages of a civilized community.

The railroad company is desirous of selling these lands to actual settlers, and will sell at low prices. The good farming lands are sold at from six to twelve dollars per acre, the variation in price depending on location, nearness to station, on timber and other circumstances affecting values.

These lands are sold on payment of one quarter down, the balance in three or five equal annual payments with annual interest at 7 per cent per annum.

The company has no disposition to sell to speculators, who may wish to hold the land out of market, its object being to aid in settling and developing the country along the line as fast as possible.

Letters of inquiry promptly answered by addressing,

EDWIN SAUNDERS,
Land Commissioner.

Saginaw, Mich.

GRAND RAPIDS & INDIANA RAILROAD LANDS.

GRAND RAPIDS, MICH., *September 25, 1896.*

HON. C. H. MORSE, *Commissioner of Labor, Lansing, Mich.:*

DEAR SIR—Replying to your favor of the 23d inst.: This company's lands are in Montcalm, Mecosta, Newaygo, Osceola, Lake, Clare, Missaukee, Wexford, Kalkaska, Grand Traverse, Antrim and Charlevoix counties. There are also a few scattering acres in Allegan, Kent, Otsego, Manistee and Emmet. By far the greatest acreage is in Osceola, Wexford, Kalkaska, Grand Traverse, Antrim and Charlevoix counties. There were originally granted to us some 20,000 acres of plains on which there was little or no timber, none of any value. In some cases they had a small growth of scrub-jack pine and oak grubs and a clean white sand instead of a soil. The company was not granted any swamp lands, properly speaking. There was more or less swamp in several counties, but no classification of them was made. On the company's records we keep account of only two classes of lands—the pine and hardwood. Everything not valuable for pine was classed as hardwood.

All the company's lands were very carefully examined by experts and an estimate of the several varieties of timber was made. Prices are based on the quantity and quality of the timber and the distance from market, and of course have a wide range of prices. This course was followed in valuing the company's pine, and the same policy is now pursued with regard to hardwood and hemlock. Our lands considered desirable for farming are generally heavily timbered with sugar maple, beech, etc.

Hardwood lands sell from say, $4 up to $10 and $12 per acre. Where lands are heavily timbered and near market and are to be manufactured into timber products, terms are cash, or part cash and the remainder before timber is removed. Where lands are required for farming purposes a one-fourth or one-half payment is demanded, the remainder of the principal being payable in equal annual payments.

I send with this maps of Wexford and Kalkaska counties; to each is attached a printed estimate of the several varieties of hardwood timber, also an estimate of the hemlock. As before stated all the pine has been sold. At the time these maps were printed there was still pine in both of said counties. I also send a pamphlet which was printed some years ago, but gives reliable general information of the land grant.

Parties writing this office for information regarding company's lands can be furnished with a plat of any township that they desire to examine and detailed information as to the character of the timber, soil, etc.

Yours truly,

W. S. Howard,

Land Commissioner.

Grand Rapids, Mich.

DETROIT, MACKINAC & MARQUETTE RAILROAD LANDS.

Detroit, Mich., *September 15, 1896.*

Hon. Chas. H. Morse, *Commissioner of Labor, Lansing, Mich.*:

My Dear Sir—The Detroit, Mackinac & Marquette Railroad Company have a large amount of land in the Upper Peninsula of Michigan. These lands are situated in the counties of Chippewa, Mackinac, Schoolcraft and Marquette, and embrace many thousand acres of the best agricultural lands in the State of Michigan.

Among the lands in the counties of Chippewa and Mackinac are large tracts of what are known as the Burnt or Cleared Lands, the original growth of timber having been removed to a great extent by forest fires, leaving the lands partially cleared, and requiring but little labor or expense to fit them for the plow. The timber remaining on those lands and in their immediate vicinity is mostly hardwood, so that no danger of future fires need be apprehended. The soil is a rich clay loam of great depth and is practically inexhaustible, producing better crops as it is worked from year to year. These lands offer many advantages over the prairie lands of the west, in addition to being nearer the markets, as the timber remaining on and in the vicinity of the land is sufficient for the settler's use for building, fencing and fuel.

Natural grass meadows are interspersed among these lands, producing the finest natural grasses, such as blue joint and red top, from one to two tons per acre, supplying abundant food for stock.

These partially cleared lands are offered at the low price of $4.00 to $5.00 per acre, one-fourth cash and the remainder within a reasonable time, with interest payable annually at 7 per cent.

The lands more immediately on the line of the Detroit, Mackinac & Marquette Railroad and the Minneapolis Railroad are timbered with a variety of woods, such as beech, maple, lynn, black birch, pine, cedar, tamarack, etc., and are generally good agricultural lands, leaving splendid farms when the timber is removed. These lands offer special inducements to the settler, being timbered with a variety of woods, all of which are of value, and for which the settler can find sale in place of being obliged to burn them in clearing the land. The beech, maple, lynn, black birch, white pine and hemlock always command a good price for lumber, the cedar for posts, telegraph poles and railroad ties, large quantities of which are being shipped to the western roads, dependent upon this and similar places for their supplies. There must of necessity be an increasing demand from year to year for this timber, and this, together with the large lumbering interest here, offer constant work to all when not occupied with the necessary labor of the farm. No waste need be made, as all timber or wood not suitable for other purposes can be turned into charcoal.

The lands adjacent to the railroad and the timber lands are offered at $4 per acre and upward, according to location and value of timber, etc.

Very truly yours,
E. W. COTTRELL,
Land Commissioner.

22 Telephone Building, Detroit, Mich.

PART IV.

PENAL AND REFORMATORY INSTITUTIONS.

REPORTS FROM WARDENS AND SUPERINTENDENTS OF PENAL AND REFORMATORY INSTITUTIONS.

Complying with the request of the Commissioner of Labor, wardens and superintendents have made reports of penal and reformatory institutions in the State.

These reports give in brief form the number of inmates, cost of food and clothing, occupation, price received from contract labor, number in hospital, number of deaths and number released on parole.

Connected with all of these institutions, except the Detroit House of Correction, are farms or gardens. The amount of produce raised is reported by each.

The number of officers and employés and the aggregate salaries give something of the expense of maintaining these places of confinement.

It may be said Michigan's penal and reformatory institutions are in good condition, well managed, and compare very favorably with similar places in other states.

The reports of the Superintendents of the Industrial Schools for Girls and Boys, though brief, are interesting. In a few words they show what the inmates are doing toward their own support, and something of the manner in which they are sent out from the schools.

These schools, under the very able management of Mr. J. E. St. John and Mrs. Lucy M. Sickels, are excelled by no similar institutions in this country. At the request of the Commissioner of Labor they have furnished for this report articles covering the manner of dealing with the inmates of the Institution under their control, which will be found very interesting. The boys and girls of the State are worth saving, and the State is receiving good returns for every dollar invested for the maintenance of these reformatories.

STATE PRISON AT JACKSON.

EMPLOYES.

Warden	1
Deputy Warden	1
Chaplain	1
Guards	22
Keepers	22
All others	11
Whole number of employés	58

Aggregate salaries paid all employés, $45,085.33.

CONVICTS.

Number of convicts received during year ending Oct. 31, 1896	251
Number of convicts died during year ending Oct. 31, 1896	8
Number of convicts escaped during year ending Oct. 31, 1896	0
Number of convicts recaptured during year ending Oct. 31, 1896	0
Number of convicts released on parole during year ending Oct. 31, 1896	18
Number of convicts released otherwise during year ending Oct. 31, 1896	200
Number of convicts transferred to other prisons during year ending Oct. 31, 1896	3
Number of convicts in hospital Oct. 31, 1896	7
Whole number of convicts in prison Oct. 31, 1896	820

Employed on Contract Work

Names of contractors.	No. convicts.	Wages, daily.
Withington & Cooley M'f'g. Co.	179	$0 51
Austin, Tomlinson & Webster M'f'g. Co.	23	50
Derby Cycle Co.	99	40
C. W. Hills	20	50
Bronk-Buffington Shirt Co.	244	35

Employed on State Work.

Kind of goods manufactured.	No. convicts.
Brooms and whisks	34
Boxes, shooks, etc.	25
Clothing department	35
Engineer's department	17
Farm department	10

GOODS MANUFACTURED ON STATE ACCOUNT, WITH ESTIMATED VALUE.

1,203 dozen brooms, 1,600 gross whisks	$11,716 33
Boxes, box shooks, crating, etc	11,555 99
Clothing for convicts	3,559 67
Officers' uniforms and clothing for discharged prisoners	2,597 56

The cost of material for boxes, box shooks, etc., was $7,616.13.

Number employed about the prison as cooks, scavengers, etc	91
Number idle	33

It costs on the average a little over 9 cents per capita per day for feeding and clothing convicts.

PRODUCTS RAISED ON PRISON FARM.

Number of bushels of potatoes, 673; bushels of beets, 285; bushels of onions, 693; bushels of turnips, 54; bushels of tomatoes, 364; bushels of green corn, 648; bushels of green peas, 70; bushels of small fruit, 11; tons of cabbages, 53; tons of hubbard squashes, 12; barrels of cucumbers, 86; bunches of celery, 3,700; bushels of radishes, 165; bushels of beet greens, 200; bushels of string beans, 67; bushels of lettuce, 35; bushels of spinach, 76; bushels of vegetable oysters, 25; bushels of carrots, 500; bushels of parsnips, 300; bushels of white beans, 15; tons of Hungarian hay, 5.

Respectfully,
WM. CHAMBERLAIN,
Warden.

STATE HOUSE OF CORRECTION AT IONIA.

EMPLOYES.

Warden	1
Deputy Warden	1
Chaplain	1
Guards	9
Keepers	27
All others	16
Whole number of employés	55

Aggregate salaries paid all employés, $37,207.68.

CONVICTS.

Number of convicts received during the year ending Oct. 31, 1896	331
Number of convicts died during year ending Oct. 31, 1896	4
Number of convicts escaped during year ending Oct. 31, 1896	9
Number of convicts recaptured during year ending Oct. 31, 1896	3
Number of convicts released on parole during year ending Oct. 31, 1896	27

Number of convicts released otherwise during year ending Oct. 31, 1896	325
Number of convicts transferred to other prisons during year ending Oct. 31, 1896	1
Number of convicts in hospital Oct. 31, 1896	8
Whole number of convicts in prison Oct. 31, 1896	518

Employed on Contract Work.

Names of contractors.	No. convicts.	Wages, daily.
Michigan Knitting Co.	Daily ave., 31	$0 40
Imperial " "	" " 37	40

Employed on State Work.

Kind of goods manufactured.	No. convicts.
Cane top stools and canning chairs	Daily ave, 106.
Furniture	" " 150.

GOODS MANUFACTURED ON STATE ACCOUNT, WITH ESTIMATED VALUES.

108,854 chairs caned	$7,996 36
1,553 stools caned	310 60
905 sideboards, 100 chiffoniers, 200 fire screens, 450 hat racks, 625 music cabinets, 5,600 bedroom suits	115,000 00

Number employed about the prison as cooks, scavengers, etc	45
Number idle	39

It costs on the average of 8½ cents per capita per day for feeding and clothing convicts.

PRODUCTS RAISED ON PRISON FARM.

Number bushels of oats, 136; bushels of potatoes, 1,537; bushels of beets, 133; bushels of onions, 600; bushels of turnips, 260; bushels of tomatoes, 200; bushels of small fruit, 50; heads of cabbages, 7,000; bushels of cucumbers, 75; bushels of beans, 17; heads of cauliflower, 35; bushels of lettuce, 75; bushels of sweet corn, 260; bushels of carrots, 77; tons of hay, 80; bushels of parsnips, 75; bushels of vegetable oysters, 25; gallons of milk, 3,750.

Respectfully,

OTIS FULLER,

Warden.

BRANCH PRISON AT MARQUETTE.

EMPLOYES.

Warden	1
Deputy Warden	1
Guards	6
Keepers	5
All others	11
Whole number of employés	44

Aggregate salaries paid all employés, $18,763.32.

CONVICTS.

Number of convicts received during year ending Oct. 31, 1896	60
Number of convicts died during year ending Oct. 31, 1896	0
Number of convicts escaped during year ending Oct. 31, 1896	2
Number of convicts recaptured during year ending Oct. 31, 1896	3
Number of convicts released on parole during year ending Oct. 31, 1896	11
Number of convicts released otherwise during year ending Oct. 31, 1896	58
Number of convicts transferred to other prisons during year ending Oct. 31, 1896	0
Number of convicts in hospital Oct. 31, 1896	1
Whole number of convicts in prison Oct. 31, 1896	205

In this prison no convicts are employed on contract work, and none work on State account. The convicts are employed at grading prison grounds, removing sand, at school and drill.

Number employed about the prison as cooks, scavengers, etc........ 16

The other convicts are not permitted to be idle, and are kept at work on sand bank and drilling.

Average cost per day for feeding convicts	9 1-4	cents
Average cost per day for clothing convicts	2 9-10	"
Total cost of feeding and clothing convicts per capita	12 1-7	"

PRODUCTS RAISED ON PRISON FARM.

Number of bushels of potatoes, 905; bushels of beets, 25; bushels of turnips, 135; ears of green corn, 4,000; bushels of green peas, 93; heads of cabbage, 2,075; bushels of cucumbers, 55; bushels of beans, 22; bushels of carrots, 41; bushels of lettuce, 70; radishes, 2,600.

Respectfully,
J. R. Van Evera,
Warden.

DETROIT HOUSE OF CORRECTION.

EMPLOYES.

Superintendent	1
Deputy Superintendent	1
Guards	6
Overseers	12
Teacher	1
All others	24
Whole number of employés	45

Aggregate salaries paid all employés, $36,000.

CONVICTS.

Number of convicts received during year ending Oct. 31, 1896	1,972
Number of convicts died during year ending Oct. 31, 1896	33
Number of convicts escaped during year ending Oct. 31, 1896	0
Number of convicts recaptured during year ending Oct. 31, 1896	0
Number of convicts released on parole during year ending Oct. 31, 1896	2
Number of convicts released otherwise during year ending Oct. 31, 1896	2,113
Number of convicts transferred to other prisons during year ending Oct. 31, 1896	0
Number of convicts in hospital Oct. 31, 1896	4
Whole number of convicts in prison Oct. 31, 1896	425
Daily average number of convicts for year	477

Goods manufactured on prison account.	Convicts employed.	Estimated value of product.
Chairs	255	$105,000
Pearl buttons	115	50,000

Number employed about prison in laundry, kitchen, scavengers, etc.	107
Number idle	0

It costs an average of about 8 cents per capita per day for feeding convicts.

Detroit, Mich., Nov. 14, 1896.

HON. C. H. MORSE, *Commissioner of Labor, Lansing, Mich.:*

DEAR SIR—Yours of 11th inst. received, and I herewith return you answers to the list of questions submitted. As our fiscal year does not close until Dec. 31, the replies to some of your questions we were obliged to approximate. In reply to the question as to the "cost of feeding and clothing inmates," I have given the cost of feeding alone, as the cost of clothing is included with that of the bedding in our accounts. The estimated value of the product of our chair and pearl button departments includes the value of the raw material; the value of the free labor expended on the material in its different stages of development *before it ever reaches the prison* to be there completed by prison labor; also the *finished product* of manufacturers *outside of the prisons,* which it was necessary to utilize to perfect the article manufactured and complete same ready for placing on the market; and lastly the value of the prison labor expended thereon, and also the margin of profit between the cost as represented by the foregoing items, and the market price of the finished product. While the value of the product of prisons is generally referred to and represented as being the amount of "convict labor" competition with free labor, as a matter of fact but a very small part of the value of the finished product is represented by "convict labor."

Yours truly,
JOS. NICHOLSON,
Superintendent.

INDUSTRIAL SCHOOL FOR BOYS.

EMPLOYES.

Superintendent	1
Assistant Superintendent	1
Teachers	12
All others	36
Whole number employés	50

Aggregate salaries of employés, $20,091.38.

INMATES.

Number inmates received during year ending Oct. 31, 1896	330
Number inmates died during year ending Oct. 31, 1896	2
Number of inmates escaped during year ending Oct. 31, 1896	0
Number inmates released on parole during year ending Oct. 31, 1896	268
Number inmates in hospital Oct. 31, 1896	3
Whole number of inmates at the school Oct. 31, 1896	564

It costs an average of 9 1-3 cents per capita per day for feeding and clothing inmates.

PRODUCTS RAISED ON SCHOOL FARM.

Tons of hay, 30; bushels of oats, 218; bushels of potatoes, 2,212; bushels of beets, 1,751; bushels of onions, 213; bushels of carrots, 886; bushels of turnips, 31; heads of cabbage, 2,784; tons of ensilage, 240.

J. E. ST. JOHN,
Superintendent.

INDUSTRIAL HOME FOR GIRLS.

EMPLOYES.

Superintendent	1
Assistant Superintendent	1
Teachers	7
All others	27
Whole number employes	36

Aggregate salaries of employes, $10,622.97.

INMATES.

Number inmates received during year ending Oct. 31, 1896	108
Number inmates died during year ending Oct. 31, 1896	0
Number inmates escaped during year ending Oct. 31, 1896	0
Number inmates recaptured during year ending Oct. 31, 1896	0
Number inmates out on leave of absence during year ending Oct. 31, 1896	12
Number inmates out on contract during year ending Oct. 31, 1896	157
Number inmates in hospital Oct. 31, 1896	0
Whole number inmates at the school Oct. 31, 1896	304

It costs an average of 11 cents per capita per day for feeding and clothing inmates.

PRODUCTS RAISED ON SCHOOL FARM.

Tons of hay, 35; bushels of oats, 432; bushels of potatoes, 1,508; bushels of beets, 60; bushels of onions, 15; bushels of carrots, 55; bushels of turnips, 500; bushels of tomatoes, 233; bushels of pears, 4; bushels of peaches, 51; bushels of small fruit, 42; heads of cabbage, 1,325; bushels of rye, 63; pounds of grapes, 1,686; melons, 500.

Respectfully,

LUCY M. SICKELS,

Superintendent.

COMMUNICATION FROM SUPERINTENDENT OF INDUSTRIAL HOME.

ADRIAN, MICH., *December 14, 1896.*

HON. CHAS. H. MORSE, *Commissioner of Labor, Lansing, Mich.*:

MY DEAR SIR—An act to establish an institution styled the Michigan Reform School for Girls was approved May 31, 1879. The first girl was received August 3, 1881. Two cottages—Gillespie and Clark—were immediately erected.

The number has increased to seven cottages, with chapel, school-house, administration building, engineer's cottage, two farm houses, boiler house, carpenter shop, two barns, cattle shed and carriage house, ice house and several smaller buildings about the barn. There are 92 acres of land in the farm.

Value of real estate	$145,128 91
Value of personal property	45,627 81
Total value of property	$190,756 72

First superintendent	Miss Emma Hall
Second superintendent	Miss Margaret Scott
Present superintendent	Mrs. Lucy M. Sickels

The name was changed from Michigan Reform School for Girls to State Industrial Home for Girls, in 1883.

Number of girls received since opening the institution		1,164
Number discharged for good conduct	363	
Number discharged at expiration of time	83	
Number discharged as unfit subjects	75	
Number discharged for various reasons	228	
Number of deaths	12	
Total	761	

The causes of commitment are assault and battery, frequenting saloons, receiving stolen goods, larceny, perjury, disorderly conduct, wayward and unmanageable, truancy, vagrancy, prostitution, running away from home, cruelty to animals.

When a girl has been at the Home sufficiently long to show by her conduct that she can be trusted and has become acquainted in a measure with the details of housekeeping to warrant it, she is placed in a suitable home, recommended by the county agent of the county in which the family resides. The amount of wages paid per week varies from seventy-five cents to one and one-half dollars; all over one dollar being paid to the treasurer of the Home by the employer, and placed in a savings bank to be given to the girl when discharged. Every quarter blanks are sent out containing certain questions concerning her moral and physical condition, which the employer is expected to answer and return. Correspondence is also carried on between the superintendent and the employer and employed, the homes are sometimes visited, so that the girl feels that she is in touch with the Home.

Amount earned by the girls on contract during the fiscal year ending June 30, 1896	$3,616 00
Amount reserved in bank	635 38

By faithful labor and pleasant surroundings we are trying to fulfill the aim of the institution. All the girls are taught domestic work, to wash, iron, cook, sew, sweep and to perform all household duties.

In the afternoon they attend school, which is well graded, and are taken to the ninth grade. In the dressmaking department a competent dressmaker gives instruction in this branch.

Cleanliness, nutritious diet, regular living, systematic work, rest and care, in time produce good results as witness the excellent health and improved character of the inmates.

Very respectfully,
LUCY M. SICKLES,
Superintendent.

COMMUNICATION OF SUPERINTENDENT OF INDUSTRIAL SCHOOL.

LANSING, MICH., *November 12, 1896.*

HON. C. H. MORSE, *Commissioner of Labor, Lansing, Mich.:*

MY DEAR SIR—Knowing that the tax payers all through the State of Michigan will be quite apt to read your report, I desire you to incorporate therein a short sketch of the work being done in the institution over which I preside.

The Industrial School for Boys at Lansing, Michigan, was built in 1856, and was called at that time the "House of Correction." It was walled in with a twenty-foot fence, and the sleeping rooms were all small prison cells where every boy was locked in at night. The institution was, in every sense of the word, except in name, a prison. For many years the affairs of the "House of Correction" were conducted on a prison basis. Many of the boys who were needed to work on the farm and do other work outside the institution were compelled to wear a ball and chain to keep them from escaping. Handcuffs and mancles of all sorts were used in abundance throughout the institution. There were at that time sixteen dungeons, or boiler-iron tight rooms, in which boys were placed for punishment and kept on bread and water for days and months at a time. At that time, all the schooling the boys received was during the hours between six and eight o'clock in the morning, and five and seven at night. The day time was devoted to work.

Several years later the name of the institution was changed to "Reform School," and the methods of conducting the affairs of the institution were greatly modified. About seventeen years ago, through the instrumentality of Governor and Mrs. Bagley, the high fence was removed and some locks were also removed from the cells, and many other changes made through the institution which made it much less a prison. As it was found necessary to replace the old buildings with new and modern buildings, the cell rooms were done away with, and the cottage system put in operation. It goes without saying that the wisdom of the management under which these changes were made has been fully demonstrated. Every year seems to be crowned with greater success in the reformation of the wayward boys committed to this institution.

In 1893, at the suggestion of General R. A. Alger, the name of the institution was again changed by act of the legislature from "Reform School" to "The Industrial School for Boys." That, in my opinion, was one of the grandest things that could be done for the school.

Up to this date—November 12, 1896—there have been received at the school 6,384 boys. There are at present in the institution, 571. It may not be understood by people generally that we release boys on leave of absence. They are committed here between the ages of ten and sixteen to remain until seventeen, unless sooner released. They remain in the school on an average of about twenty to twenty-four months. If granted leave of absence, such release is conditioned upon their good behavior, and they can be returned to the school by the board of trustees at any time if it is found necessary. That has a very great restraining influence upon the boys until they arrive at the age of seventeen, when they are entirely clear from the school. In years past they were committed to remain until twenty-one. Later on, a change was made by the legislature making the maximum age of retention eighteen. Still later on, the term of commitment was reduced to seventeen. I think, however, that they should be committed until eighteen, as it is very often the case when a boy is committed to this school at the age of fifteen years, and say nine months, he can only be retained in the institution a year and three months at the longest, which is scarcely long enough to work out his reformation. I should be glad to see that change made in the law at any time.

We have at present about seven hundred boys who are out on leave of absence through the State.

I think the tax payers through the country should know about these public institutions, how they are managed and whether or not the money which is appropriated by the legislature is expended for the best interest of the inmates; and it seems about impossible for them to know about these institutions unless they visit them and look over the work personally. Different institutions differ so widely in their needs and in the scheme of managing them, that it is difficult to judge of one by visiting another.

Those who are not familiar with the work of the Industrial School for Boys have an erroneous idea in regard to the kind of work performed by our teachers and other employés. They are on duty almost constantly during the whole day, and are responsible for the safe keeping and good conduct of the boys at night. There is a feeling of responsibility connected with the work of this institution that differs widely from all clerical or mechanical work. It is impossible to care for six hundred boys with the amount of help it would require to care for four hundred. I feel sure that no tax payer in the State of Michigan wishes this institution conducted in a way that will not result in the greatest good to the unfortunate boys who are committed to its care. The object is to reform all wayward boys if possible, and at the same time teach them trades which will fit them for becoming good, honest, self-supporting citizens after they leave the school.

Many of the boys who have no homes are provided with good homes among the farmers in the different counties, where they are looked after by the county agents and myself as State agent of the school. It is impossible to furnish a tabulated statement showing the exact number of boys reclaimed, but I am perfectly safe in assuming that a very large percentage of those committed to this institution are reclaimed.

I am in correspondence with a very large number who, in years past, have been connected with the school, besides the several hundred who are out on leave of absence, which gives me a wide range upon which to base my calculation; but I would not attempt to say just what percentage is saved. We are at present in a very crowded condition in the school. Two years ago the legislature appropriated money for the erection of a cottage which will accommodate fifty boys. We are building that cottage by the day, which will prove a great saving to the State. We expect to have it completed before the first of January, and shall at once put it in operation which will relieve our crowded condition somewhat in the main building, although at the rate we are receiving boys now we shall have fifty more than the maximum number for which the institution was intended, by the first of January.

For several years the legislature has appropriated $56,000 a year for the running expenses of the school. That was based upon an average attendance of a much less number than we are having to take care of at present. Our board felt the necessity of asking for a very small increase in the current expense appropriation which will enable them to clothe and teach and train about one hundred boys extra.

If the tax payers can only appreciate what is being done for these boys, they will consider that the money is well invested.

We have 260 acres of land on which we do quite a large amount of farming. We keep a herd of forty cows which furnish the boys milk for supper. Last year we raised 2,500 bushels of potatoes which just carried our boys through the winter; this fall our crop is a little short, but we have already placed in the cellar 2,200 bushels. We raise a large amount of roots of different kinds for the cows, and also for the boys.

We teach seventy-five boys the carpenter's trade, seventy boys the tailor's trade, fifty boys the printing business, and quite a number of boys the baker's trade and shoemaking. We have quite a number of boys who work in the engine room, and it takes about one hundred boys to do the house work in the different buildings throughout the institution. We employ about forty-eight people. Our boys do the farm work under competent overseers. We have at present twelve teachers, ten of whom are women.

The great depression that has been felt in all kinds of business throughout the State has a tendency to increase our numbers, as idleness is a prolific cause of crime, and with a large number of men without work, it is difficult for boys to find employment.

We are not asking for any money with which to erect new buildings during the next two years. All we need is for running expenses and a small amount to repair and remodel our steam and water plant.

There seems to be a prevailing idea in the minds of the people of our commonwealth that industrial schools, reform schools and other institutions for juvenile delinquents should be run on a money-making basis. This state of feeling is most unfortunate, for, in my opinion, the moment you introduce methods of conducting the affairs of an institution upon the basis of working its inmates for revenue, you lose sight of the most important feature, which is the moral part of the work, or that feature which looks to the reformation of the inmates. Not that I would encourage idleness, for of all conditions, I consider idleness the most vicious. There should be good wholesome work provided, but its principal object should not be a source of revenue.

I feel sure that if the people in Michigan could visit our school, look it over, see what is being done for the boys and could know what a large majority of the boys are doing who have once been in the school, they would be perfectly satisfied with the small amount of taxes which they are asked to pay for the support of The Industrial School for Boys at Lansing.

I do hereby extend to each and all a cordial invitation to call on us at an early date; I can assure them courteous treatment, and feel confident that they will not regret doing so.

Very truly,
J. E. ST. JOHN,
Superintendent.

PART V.

STRIKES.

In accordance with former practice the Michigan Labor Bureau has only taken cognizance of those strikes in the State which have assumed sufficient proportions to attract attention.

Mr. Philip A. Loersch, ex-secretary of Detroit Trades Council, was asked to furnish a history of such strikes in Detroit. He gave the matter careful attention, and presumably his reports are correct.

The secretary of the Detroit Stove Works also gave a report of the strike of the employés of that firm.

The strike at Eastlake by employés of the receiver of the R. G. Peters Salt & Lumber Company; that at the shipyards of F. W. Wheeler & Company, and other minor strikes were investigated by representatives of this Bureau, and are doubtless correctly reported.

Colonel Carroll D. Wright, National Commissioner of Labor, in the third and tenth annual reports from the National Department of Labor, gives full and minute statistical information of strikes and lockouts in the United States from January 1, 1881, to June 30, 1894. These reports are replete with valuable information which cannot be obtained elsewhere. It is impossible to reproduce the tables here, but the analysis by Colonel Wright is given in full and will command the careful study of persons interested in the question of strikes and lockouts.

MR. LORESCH'S REPORT.

DETROIT, MICH., *December 14, 1896.*

HON. C. H. MORSE, *Commissioner of Labor, Lansing, Mich.:*

DEAR SIR—In compliance with your request to embody in your annual report a short resume of the strikes that took place during the past year in Detroit the same are hereby presented:

THE CIGARMAKERS' STRIKE.

In your last annual report the cause of the strike of the cigarmakers was explained fully by one of the members, who was thoroughly familiar with it. Since the inauguration of this strike another one took place in February last at the factory of C. P. Collins & Co., who refused to longer pay the union scale, thereby locking out their men. This particular shop has always been regarded as one of the best in Detroit. The men employed there were added to the others, bringing the total number at that time up to over 300. Since that time the financial agent of the international came to the city and, after a good deal of hard work for a settlement, effected it at one of the largest shops, and in consequence a number of cigarmakers secured employment again. At the present time there are still a large number of cigarmakers on strike. To support the members on strike large sums of money were received from the international union and from other unions of this city and throughout the country. Negotiations are under way to bring the strike to a speedy settlement, and it is held by many cigarmakers that this will be accomplished.

THE PRINTERS' STRIKE.

For the first time in many years the printers were engaged in a strike at the office of John F. Eby & Co. The cause of this trouble was the refusal of the concern to recognize the union scale of wages and hours regulating offices in which typesetting machines are employed. The strike commenced February 10 and lasted until May 12, when articles of agreement were signed between the company and the union. The machines were abandoned, the men who went out on the union's call were taken back and the office is again a union office. In order to gain their end the union published a weekly paper in which were presented the causes of the trouble. This little sheet was the means, to a great extent, of settling the difficulty. No violence of any sort occurred during the trouble, everything being conducted in a peaceable manner. In the strike not only the compositors, but also the pressmen and feeders were engaged.

THE BOOKBINDERS' STRIKE.

Another trade closely allied with the printing industry, that had a little difficulty, were the bookbinders, who were on strike for a very short time on account of the firms refusing to sign the scale as prepared after several conferences, where mutual concessions were made. The scale was signed by all the leading houses with one exception. Negotiations are under way to also induce this house to recognize the union.

THE BAKERS' STRIKE.

There are two unions affiliated with the international union of bakers—a German and an English speaking union. Within the past month trouble arose in one of the smaller bakeries. The cause of it appears to be that one of the German union's members violated his obligation to the union, in consequence of which he was suspended. He secured employment and, it is alleged, formed a co-partnership by filing papers according to the laws of the State. The members of the German union working there were called out and their places taken by members of the English union. It is claimed that a good deal of the misunderstanding is caused by the difference in language between the two unions, and there appears to be a lack of harmony. The probabilities are that this trouble will be adjusted in short order.

THE STOVE MOUNTERS' STRIKE.

In the trade of making stoves a trouble occurred in the Detroit Stove Works, in which the stove mounters and metal polishers were engaged. About 80 men were involved. The cause of the trouble was the failure of the firm to live up to a verbal agreement regarding the employment of apprentices. At one time it looked as though all the molders in the same concern would also strike out of sympathy. The officers of the international union came to the city and carefully looked over the ground but no strike was ordered. Both sides made concessions, and by good judgment being used a large strike was averted. The strike lasted about three months. This was the only strike where any violence was resorted to, some of the non-union men who came here being attacked by the strikers. The men who have the interest of the union at heart strongly condemned this action. Since the strike was adjusted everything is working in good order.

THE CARPENTERS' STRIKE.

The carpenters, who have for years been endeavoring to inaugurate the eight-hour work day and a rate of 25 cents an hour, early in the spring resorted to a strike to gain their desired end, holding that this was the only way to accomplish it. For months meetings were held to enlighten the members, not only of the unions, but also those outside of the ranks of organized labor, in regard to the justness of their demands. It is held by every fair minded business man that this trade was one of the poorest paid of all trades, taking into consideration the cost of the tools that carpenters must have. As in many other trades improved machinery has made many inroads. A large number of the employers held that the demands were just, but some of the largest of these were unwilling to concede. Some 1,500 carpenters were engaged in the struggle. Terms were made that with the opening of the new year the eight-hour day with 25 cents per hour will be granted. This will give the employers an opportunity in estimating contracts for building to base their figures on the scale. No trouble of any sort occurred during the time the men were engaged on strike.

At the meetings wise counsel prevailed, and both sides in the controversy appeared to be satisfied. The hope is expressed that the coming season will be better for all sides.

THE WOOD WORKERS.

The machine woodworkers is a young union. Shortly after their organization they experienced a strike, caused by a concern locking out their men, it is claimed, on account of the men joining the union. The strike lasted eight weeks, when mutual concessions were made.

A few strikes of minor importance occurred, mainly in the ranks of non-union men.

The past year was remarkably free of trouble in the industrial field of Detroit. The reputation of Detroit workingmen was upheld in every respect. Calm judgment was used in adjusting all the troubles. The Trades Council was an important factor in this regard, its membership being composed of cool-headed men, who would never countenance any violence. In some instances it was attempted, on the other side, to make it appear that it was necessary to have the police appear on the scene, but all these fears came to naught. In only one instance, as noted in this article, violence was resorted to, and this action was strongly condemned.

The unions of this city have shown a steady increase in membership, and a large number of new unions were formed, and during the year only a few have disbanded. As in other cities of the country Detroit had its quota of unemployed men, many of the unions having a large number of such. The general stagnation of business caused a great deal of idleness. Another cause of so many being out of employment is improved machinery. It must also be said, and this cannot be denied, that any number of men are being thrown out by the employment of girls and child labor in very many branches of industry. It is hoped that prosperity will soon come and the unemployed be taken care of.

P. A. Loersch.

DETROIT STOVE WORKS.

Detroit, Mich., *December 19, 1896.*

Hon. C. H. Morse, *Commissioner of Labor, Lansing, Mich.:*

Dear Sir—Replying to yours of the 16th inst., addressed to our President, Mr. E. S. Barbour, in reference to our recent strike, would say briefly that it was a strike of mounters and metal polishers; not stove molders, as stated in yours of the 16th.

The strike began with the mounters on the 26th day of May, 1896, and ended September 22, 1896. The number involved were 48 mounters and 26 polishers. The cause, as briefly as can be stated, was from arbitrary and unreasonable interference on the part of the shop committee. We had no trouble whatsover with our apprentices. We were working the full quota of same as prescribed by the Union. The question involved was an interpretation as to how we should work our apprentices, whether they should be under the jurisdiction of the shop committee or foreman of the shop.

The cause of the metal polishers going on a strike, which began on July 15, 1896, was that of sympathy. We had no controversy whatsoever with the polishers.

The settlement was accomplished by the striking mounters accepting a code of rules to govern the works for the last half of the year 1896, which settlement was proposed to them about ten days after we first began the controversy.

I think I have stated the difficulty as briefly as possible. To go over the whole matter minutely would be too voluminous. The facts are in the abstract as above stated.

In reference to violence, there was a variety of that from beginning to end. The striking polishers, I regret to say, showed a disposition to resort to violence. I know of none of a serious nature practiced by the striking mounters. The details and nature of the violence was chronicled all over the country by the Associated Press dispatches, which, no doubt, you are perfectly familiar with.

Trusting that this may suffice your purpose, we are,

Very respectfully yours,

DETROIT STOVE WORKS.

L. Crowley, *Superintendent.*

THE R. G. PETERS SALT AND LUMBER COMPANY.

East Lake, Mich., *December 19, 1896.*

Hon. C. H. Morse, *Commissioner of Labor, Lansing, Mich.:*

Dear Sir—Your letter of the 16th is before me and contents carefully noted. In reply will say:

The strike referred to occurred on the works of the Michigan Trust Co., receiver of the R. G. Peters Salt and Lumber Co., at East Lake, Michigan.

In the early part of August we notified our men, that on account of low prices and the accumulation of stock, there would be a reduction in wages of 10 per cent, to take effect August 15. This 10 per cent reduction would put the most common cheap labor to $1.00 per day. August 15 was Saturday, and the men worked as usual. On Monday morning, August 17, when the mills were ready to start, a number of the common laborers, mostly Polish, congregated in front of the office instead of taking their usual places in the mills, and we found that we were too short handed to start, so shut down our mills and salt block. All we kept running was one boiler to make steam to supply fire protection. We kept the blacksmith shop running on repairs, with two men, and we kept about six men on the lumber yard to sort and pile about 50,000 feet of common lumber that had been cut Saturday and which was liable to stain. Tuesday morning a number of the Polish and Scandinavians appointed a committee of four to call on our men that were working and notify them that if they did not stop work at noon they would come with a crowd in the afternoon and drive them from their work.

I verified this and notified our men to continue their work, and we would protect them. I called on the sheriff and he responded with two deputies.

About 1:30 p. m., Tuesday, August 18, a crowd of two or three hundred men, armed with sticks and clubs, started for our works, and were halted by the sheriff at the entrance of the lumber yard and told to disperse. They were inclined to be ugly, and attacked the sheriff and wounded the under sheriff on the hand and arm. They were stopped, however, and dispersed, and three arrests were made at that time and later on six others were arrested.

The sheriff and his deputies were in charge until the following Monday, when we started our works again with a full crew and have had no trouble since. When we started up, we had three times as many men as we could use, offering their services, and at the reduced scale.

As resident representative of the Michigan Trust Company, on Wednesday, August 19, I telegraphed for instructions, and on Thursday, August 20, the United States Marshal came here and posted notices on the plant warning parties against interfering with us, and later on, eight or nine of the strikers were served with a notice to appear before the United States court to show cause why they should not be punished for contempt of court.

These parties have had a hearing, but I understand that no decision has been rendered in their cases, and they have never been arrested under the United States court or summoned to appear before it personally.

In the circuit court of Manistee county, three of the rioters who attacked the sheriff were prosecuted for assault with intent to do great bodily harm, and were found guilty of simple assault. Two of them were committed to the county jail for 90 days and one for 30 days. The cases of the rioters were dropped.

Yours traly,

H. W. Carey.

REPORT OF DEPUTY FACTORY INSPECTOR KRAPF.

Office of Deputy Factory Inspector,
Saginaw, Mich., *December 22, 1896.*

Hon. C. H. Morse, *Commissioner of Labor, Lansing, Mich.:*

Dear Sir—In obedience to your instructions of December 16, I have visited several firms in my district where strikes have occurred in the past year, and have obtained the following information in regard thereto:

F. W. WHEELER & CO. SHIPYARD'S STRIKE.

On the 2d day of July, 1896, 1,300 men were employed; about 600 of these men belonged to organized labor. One man who had belonged to the Union left their ranks and was still employed by the firm. The members of the Union asked the firm to discharge this man, and the firm refused to do so, and on the 3d of July, about 600 men went out on strike because this man was not discharged. These men were not given employment, but new men were employed, and in the month of September 1,600 men were employed in the yards. The firm refused to concede to the demands of the Union men, consequently they remained in idleness until fall and the work in the yards was about completed. A few of the men left the Union and were again employed by the firm. Some obtained employment in other lines at greatly reduced wages; others left the city.

Previous to this strike the firm made no difference as to whether an employé belonged to a Union or not, and no questions were asked of them; but since the 3d of July the firm have refused to employ Union men. This strike caused a loss to the firm, but a still greater one to the strikers, and was felt by merchants and business men of both West Bay City and Bay City.

MONITOR COAL MINERS' STRIKE.

In June last the Monitor Coal Co., located in Monitor township, this county, proposed to put in a weigh scale at their tipple, on the line of M. C. R. R., about one and one-half miles from their mine. This is where all coal is loaded into the cars for shipment. The miners objected and wanted the scale put in at the mine and all coal weighed there. The company refused this request, and about 40 (the total number employed) went out on strike. The strike lasted two days and was settled in favor of the company with a committee of the miners. Several other strikes have taken place at this mine in the past year, but were of only a few hours' duration. Once the miners went out because the company would not furnish as many pushers as they thought were necessary, and they went out several times for a better price for mining, and all of these strikes have been settled in favor of the company, and the men are not receiving as good wages as they were one year ago.

SAGINAW COAL MINERS' STRIKE.

This is a new mine, and it is customary for miners to push their own coal out until they have reached a distance of seventy-five yards from the shaft. This the miners refused to do and struck for pushers. The firm refused to furnish them, and sent to Ohio for miners, and they were brought here and went to work, but after they found there had been a strike at the mine they also refused to work longer. Then some of the old and some of the new men applied and were employed. Practically the mine has never been shut down; neither has the question of pushers being furnished been fully settled. The manager of this mine says it is next to impossible to get along with these men, as they are constantly finding fault, first with one thing, then with another, and are never satisfied with the company nor their unions, as they are constantly joining and then leaving them. The coal miners are composed mostly of foreigners, Scandinavians, Finlanders, Germans, Hungarians, some English and Irish, and a few negroes.

Respectfully yours,
O. O. KRAPF,
Deputy Factory Inspector.

STRIKES AND LOCKOUTS IN UNITED STATES.

[Analysis of Tables from 10th U. S. Report.]

The Third Annual Report of the National Commissioner of Labor, entitled Strikes and Lockouts, furnished tables covering the details of all strikes and lockouts occurring in the United States for the six years beginning with January 1, 1881, and ending with December 31, 1886, together with summaries recapitulating the facts shown therein. The present report consists of similar tables and summaries for the strikes and lockouts which occurred during the seven and one-half years beginning with January 1, 1887, and ending with June 30, 1894, being modeled on the lines laid down in the Third Annual Report. A few strikes and lockouts which began in the latter part of 1886 and were omitted from the previous report, mainly because of the incompleteness at that time of the data relating to them, have been included in this report.

The definitions of a strike and of a lockout, as given in the Third Annual Report, are as follows: A strike occurs when the employés of an establishment refuse to work unless the management complies with some demand. A lockout occurs when the management refuses to allow the employés to work unless they will work under some condition dictated by the management. It appears, therefore, that these two classes of industrial disturbances are practically alike, the main distinction being that in a strike the employés take the initiative, while in a lockout the employer first makes some demand and enforces it by refusing to allow his employés to work unless it is complied with. This distinction has been kept in mind and has been the guide in separating these various disturbances into the two classes in the tabulations appearing in this report. Some difficulty has been experienced in classifying certain of these disturbances, especially those which occurred in the earlier years included in this report, owing to the inadequate information obtainable as to their causes and because of the very slight difference between a strike and a lockout as mentioned above. Great pains, however, have been taken in the classification, and it is believed to be entirely trustworthy.

Year.	Strikes.	Establishments.	Average establishments to a strike.	Employés thrown out of employment.
1881	471	2,928	6.2	129,521
1882	454	2,105	4.6	154,671
1883	478	2,759	5.8	149,763
1884	443	2,367	5.3	147,054
1885	645	2,284	3.5	242,705
1886	1,432	10,053	7.0	508,044
1887	1,436	6,589	4.6	379,676
1888	906	3,506	3.9	147,704
1889	1,075	3,786	3.5	249,559
1890	1,833	9,424	5.1	351,944
1891	1,717	8,116	4.7	298,939
1892	1,298	5,540	4.3	206,671
1893	1,305	4,555	3.5	265,914
1894 (6 months)	896	5,154	5.8	482,066
Total	14,389	69,166	4.8	3,714,231

The figures for the years from 1881 to 1886, inclusive, have been taken from the Third Annual Report. As stated in that report the figures showing the number of strikes in each of these years are estimates, although they are believed to be approximately correct. For the period included in the present investigation, namely, January 1, 1887, to June 30, 1894, inclusive, the figures showing the number of strikes may be accepted as absolute. The figures showing the number of establishments and the number of employés thrown out of employment by strikes may be accepted as correct for the whole period from 1881 to 1894, inclusive. In using this table it should be borne in mind that the figures for 1894 are for the first six months of that year only, the investigation having been closed June 30, 1894.

By this table it is shown that the average number of establishment to each strike for the thirteen and one-half years was 4.8, the highest number being 7 establishments to each strike in 1886,and the lowest average being 3.5 establishments to each strike in 1885, 1889, and 1893. As stated in the preceding report the strikes for 1880 were reported by Mr. Joseph D. Weeks, special agent of the Tenth Census, according to whose report the number was 610. The number of establishments involved was not reported. Commencing with 1881 the number of establishments involved was 2,928. In 1882 the number dropped to 2,105, while in 1883 it rose to 2,759, or nearly that of 1881. In 1884 and 1885 the number fell rapidly, there being 2,367 in 1884 and 2,284 in 1885. In 1886 the number rose to 10,053, the greatest number in any of the years considered. In 1887 it dropped to 6,589; in 1888 it dropped still further to 3,506 and remained nearly stationary in 1889 at 3,786, while in 1890 the number again rapidly rose to 9,424, a number almost as great as that for 1886. In the next year, 1891, the number dropped to 8,116, dropping still further in 1892 and 1893 to 5,540 and 4,555, respectively. For the first six months of 1894 the number was 5,154, indicating that, if there was a proportionately large number in the last six months of that year, it would reach in round numbers 10,300, a number slightly greater than that for 1886, in which the largest number of establishments were involved in strikes.

The total number of establishments involved in strikes during the whole period of thirteen and one-half years was 69,166. Of this number 4.23 per cent had strikes in 1881, 3.04 per cent had strikes in 1882, 3.99 per cent had strikes in 1883, 3.42 per cent had strikes in 1884, 3.30 per cent had strikes in 1885, 14.54 per cent had strikes in 1886, 9.53 per cent had strikes in 1887, 5.07 per cent had strikes in 1888, 5.47 per cent had strikes in 1889, 13.63 per cent had strikes in 1890, 11.73 per cent had strikes in 1891, 8.01 per cent had strikes in 1892, 6.59 per cent had strikes in 1893, and 7.45 per cent had strikes in the first half of 1894.

Of the 6,067 establishment having lockouts during the period of thirteen and one-half years 0.15 per cent were in 1881, 0.69 per cent were in 1882, 1.93 per cent were in 1883, 5.83 per cent were in 1884, 3.02 per cent were in 1885, 24.87 per cent were in 1886, 21.11 per cent were in 1887, 2.97 per cent were in 1888, 2.18 per cent were in 1889, 5.34 per cent were in 1890, 9 per cent were in 1891, 11.80 per cent were in 1892, 5.03 per cent were in 1893, and 6.08 per cent were in the first half of 1894. The percentage is highest for both strikes and lockouts in 1886. The next highest percentages occur in 1890 and 1891 for strikes, and in 1887 and 1892 for lockouts.

During the seven and one-half years included in the present report Illinois shows the largest number of establishments affected, both by strikes and lockouts, there being 10,060 of the former and 1,193 of the latter. Next come New York with 9,539 establishments involved in strikes and 723 in lockouts, and Pennsylvania with 8,219 involved in strikes and 490 in lockouts.

During the six years immediately preceding those included in this report, the facts for which appeared in the Third Annual Report, the State in which the greatest number of establishments were affected by strikes was New York with 9,247, followed by Illinois with 2,768, and Pennsylvania with 2,442. The greatest number affected by lockouts was 1,528, found in New York, followed by 147 in Massachusetts, and 130 in Pennsylvania, the number in Illinois being 127. Combining the facts for both these periods in order to secure a statement for the thirteen and one-half years included in both of the reports of the Department on strikes and lockouts, we find the greatest number of establishments affected by strikes to have been in New York, 18,786, followed by Illinois with 12,828, and Pennsylvania with 10,661. The States appear in the same order in lockouts, the number of establishments affected being 2,251 in New York, 1,320 in Illinois, and 620 in Pennsylvania.

The industries most affected by strikes during the seven and one-half years included in the present report were the building trades, with 20,785 establishments involved; coal and coke, with 5,958; clothing, with 3,041; tobacco, with 2,506; food preparations, with 2,398; stone quarrying and cutting, with 1,993; metals and metallic goods, with 1,884; transportation, with 1,326; printing and publishing, with 608; boots and shoes, with 607; furniture, with 459; wooden goods, with 409; and brick, with 406 establishments. The industries most affected by lockouts were the building trades, with 1,900; stone quarrying and cutting, with 489; clothing, with 431; brewing, with 150; boots and shoes, with 130; metals and metallic goods, with 128, and transportation, with 112 establishments involved. For the immediately preceding period of six years, 1881 to 1886, included in the Third Annual

Report, the greatest frequency of strikes was found in the building trades, with 6,075 establishments affected; tobacco, with 2,959; mining (practically the same as coal and coke in this report), with 2,060; clothing, with 1,728; metals and metallic goods, with 1,570; transportation, with 1,478; food preparations, with 1,419; furniture, with 491; cooperage, with 484; brick, with 478; stone quarrying and cutting, with 468; lumber, with 395; boots and shoes, with 352; wooden goods, with 240; and printing and publishing, with 223 establishments. The lockouts for that period involved 773 establishments in the clothing industry, 531 in the building trades, 226 in the tobacco industry, 155 in boots and shoes, 76 in metals and metallic goods, etc.

A combination of the facts for strikes for the two periods, selecting the thirteen industries most largely affected, shows that out of 69,166 establishments involved in strikes during the period from January 1, 1881, to June 30, 1894, 62,037, or 89.69 per cent, were in the following thirteen industries: Building trades, 26,860 establishments; coal and coke, 8,018; tobacco, 5,465; clothing, 4,769; food preparations, 3,817; metals and metallic goods, 3,454; transportation, 2,804; stone quarrying and cutting, 2,461; boots and shoes, 959; furniture, 950; brick, 884; printing and publishing, 831, and cooperage, 765 establishments.

In the lockouts which occurred during the thirteen and one-half years six industries bore a very large proportion of the burden, involving 4,914 establishments, or 81 per cent, out of a total of 6,067 establishments. The industries and number of establishments involved in each are as follows: Building trades, 2,431; clothing, 1,204; stone quarrying and cutting, 513; boots and shoes, 285; tobacco, 277, and metals and metallic goods, 204.

The total number of employés involved, or thrown out of employment, in the whole number of strikes from 1881 to 1886, inclusive, as shown by the Third Annual Report, was 1,323,203. The number, as shown by this report, for the period from January 1, 1887, to June 30, 1894, was 2,391,028. Adding these numbers together it is seen that 3,714,231 persons were thrown out of employment by reason of strikes during the period of thirteen and one-half years from January 1, 1881, to June 30, 1894. The number of strikers, or persons originating the strikes, during the first six years of this period was shown to have been 1,020,156; during the latter seven and one-half years it was 1,834,093. The number of strikers, or persons originating the strikes, during the whole period of thirteen and one-half years was therefore 2,854,249. From 1881 to 1886 there were 103,038 new employés engaged after the strikes, of whom 37,483 were brought from other places than those in which the strikes occurred. The per cent of new employés after strike, of the total number of employés before strike, 1,660,835, was therefore 6.20. The per cent of the employés brought from other places of the number of new employès after strike was 36.38. For the succeeding seven and one-half years, the period involved in this report, there were 239,431 new employés after the strikes, of whom 115,377 were brought from other places. For this period the per cent of new employés after strike of the total number of employés before strike, 4,300,257, was 5.57, and the per cent of employés brought from other places of the number of new employés after strike, 48.19. Combining the facts for both periods it is seen that there were, during the thirteen and one-half years, 342,469 new employés engaged after the strikes, and that 152,860 of that number were brought from other places. The new employés after the strikes were 5.75 per cent of the total number of employees before the strikes, 5,961,092, while 44.63 per cent of the new employés after the strikes were brought from other places than those in which the strikes occurred.

In the Third Annual Report it was shown that during the period from 1881 to 1886, inclusive, 2,214 establishments were involved in lockouts, there being 175,270 employés in the establishments before the lockouts occurred, while the number actually involved or locked out was 160,823. There were 139,976 new employés secured at the close of lockouts, 5,682 being brought from other places than those in which the lockouts occurred. For the period of seven and one-half years involved in the present report lockouts were ordered in 3,853 establishments, having 274,657 employes before the lockouts, of which 205,867 were thrown out of employment in consequence thereof. These establishments secured 27,465 new employés after the lockouts, 16,300 of whom were brought from other places. Combining the facts as to lockouts for the two periods involved it is seen that during the thirteen and one-half years from January 1, 1881, to June 30, 1894, lockouts occurred in 6,067 establishments, in which 449,927 employés were engaged. Of this number 366,690, or 81.50 per cent, were thrown out of employment by the lockouts. In these establishments there were 41,441 new employés engaged after the lockouts, of whom 21,982 were brought from other places than those in which lockouts occurred. The per cent of new employés after the lockouts of the total number of employés before lockouts was therefore 9.21, and of employés brought from other places of the number of new employés after lockouts, 53.04.

It should be remembered in considering the summaries relating to the number of establishments, the number of employés, etc., that the figures do not represent the actual number of different individual establishments or different individual employés who were involved in strikes or lockouts in a given industry or in a given year, because in many cases there have been two or more strikes or lockouts in the same establishment in the same year, and in such cases the establishment and the number of employés are duplicated or triplicated, as the case may be, in the totals derived by addition. In the column "Employés for whom strike was undertaken" in the summaries of strikes there is even more duplication of the kind mentioned. For instance, a sympathetic strike may occur in which the employés strike to enforce the demands of certain employés in another establishment. The number of employés for whom the strike was undertaken would in that case be the number for whom it was undertaken in that other establishment. The same employés would therefore appear in that column in two places in the primary tables—first, in connection with the establishment in which they were employed, and second, in the establishment in which the sympathetic strike occurred, thus unavoidably being duplicated in the tables derived by addition.

As previously stated, a small number of strikes occurring in 1886, in all 21, which were unavoidably omitted from the previous report, have been tabulated in the present one. Wherever the facts shown by the two reports are given by years this number and the various facts relating thereto have been added to the figures for 1886 as shown by the Third Annual Report. In the statements previously made, by States and by industries, they have not been so added, but appear in the totals for the period involved in the present report. The number is so small as to make no appreciable difference when comparing the two reports, and to have eliminated them in the present and added them to the Third Annual Report would have involved the reader in many difficulties.

The following table, classifying the employés involved in strikes and lockouts as to sex, combines the facts shown in the Third Annual Report with those shown in the present one:

Sex of Employés Thrown out of Employment, January 1, 1881, to June 30, 1894.

Year.	Strikes.			Lockouts.		
	Employés thrown out of employment.	Males (per cent).	Females (per cent).	Employés thrown out of employment.	Males (per cent).	Females (per cent).
1881	129,521	94.08	5.92	655	83.21	16.79
1882	154,671	92.15	7.85	4,131	93.80	6.20
1883	149,763	87.66	12.34	20,512	73.58	26.42
1884	147,054	88.78	11.22	18,121	78.93	21.07
1885	242,705	87.77	12.23	15,424	83.77	16.23
1886	508,044	86.17	13.83	101,980	63.02	36.98
1887	379,676	91.77	8.23	59,630	94.76	5.24
1888	147,704	91.50	8.50	15,176	79.53	20.47
1889	249,559	90.48	9.52	10,731	73.91	26.09
1890	351,944	90.53	9.47	21,555	72.49	27.51
1891	298,939	94.90	5.10	31,014	59.13	40.87
1892	206,671	93.57	6.43	32,014	96.02	3.98
1893	265,914	93.06	6.94	21,842	84.95	15.05
1894 (6 months)	482,066	95.13	4.87	13,905	95.83	4.17
Total	3,714,231	91.22	8.78	366,690	77.47	22.53

During the seven and one-half years, 69.39 per cent of all the establishments affected by strikes and 75.91 per cent of all affected by lockouts were located in the five states of Illinois, Massachusetts, New York, Ohio, and Pennsylvania. During the six years immediately preceding the above period it is shown in the Third Annual Report that 74.84 per cent of all establishments in the country, so far as strikes were concerned, and 89.48 per cent of all the establishments in the country, so far as lockouts were concerned, were found in the same States. The following table, combining these facts for the entire period of thirteen and one-half years included in this and the Third Annual Report, shows the percentages for each year for the five States named:

Establishments Involved in Illinois, Massachusetts, New York, Ohio and Pennsylvania, January 1, 1881, to June 30, 1894.

Year.	Strikes.			Lockouts.		
	Total establishments in the United States.	Establishments in the five selected States.	Per cent of establishments in the five selected States.	Total establishments in the United States.	Establishments in the five selected States.	Per cent of establishments in the five selected States.
1881	2,928	2,154	73.57	9	4	44.44
1882	2,105	1,499	71.21	42	23	54.76
1883	2,759	2,046	74.16	117	105	89.74
1884	2,367	1,896	80.10	354	306	86.44
1885	2,284	1,586	69.44	183	140	76.50
1886	10,053	7,675	76.35	1,509	1,403	92.98
1887	6,589	4,761	72.26	1,281	1,188	92.74
1888	3,506	2,404	68.57	180	114	63.33
1889	3,786	2,275	60.09	132	65	49.24
1890	9,424	6,990	74.17	324	203	62.65
1891	8,116	5,775	71.16	546	339	62.09
1892	5,540	3,200	57.76	716	522	72.91
1893	4,555	3,186	69.95	305	190	62.30
1894 (6 months)	5,145	3,762	72.99	369	304	82.38
Total	69,166	49,209	71.15	6,067	4,906	80.86

These five States contained 51 per cent of all the manufacturing establishments, and employed 56 per cent of the capital invested in the mechanical industries of the United States, taking the census of 1890 as the basis of computation.

The distribution of strikes and lockouts, by cities, during the seven and one-half years from January 1, 1887, to June 30, 1894, is shown in the following tables:

Summary of Strikes in the Principal Cities, January 1, 1887, to June 30, 1894.

[In the case of many general strikes extending through different cities it was found impossible to subdivide the facts and credit them to the several cities involved. In such cases the whole strike has generally been tabulated against the city most largely affected.]

City.	Total strikes.	Establishments.	Employés thrown out of employment.	Wage loss of employés.	Assistance to employés by labor organisations.	Loss of employers.
New York, N. Y.	2,614	6,467	215,649	$6,449,385	$792,817	$3,545,766
Brooklyn, N. Y.	671	1,271	31,768	914,045	145,848	582,780
Chicago, Ill.	528	8,825	282,611	8,846,494	1,886,788	14,444,084
Boston, Mass.	257	911	25,574	800,882	173,564	589,982
Allegheny and Pittsburg, Pa.	251	4,142	100,822	7,879,765	722,706	2,599,487
PhiladelphiaPa.	240	1,182	59,527	2,002,219	194,277	896,568
St. Louis, Mo.	111	1,064	19,693	848,357	96,506	572,938
Cincinnati, Ohio	109	580	17,577	736,306	72,886	572,272
Milwaukee, Wis.	100	1,237	20,778	1,265,049	112,862	799,700
Lynn, Mass.	100	110	4,027	147,028	9,871	86,488
Fall River, Mass.	95	156	30,232	500,264	22,429	118,319
San Francisco, Cal.	92	337	7,254	480,387	96,854	415,625
Baltimore, Md.	92	280	11,192	424,149	18,604	187,552
New Haven, Conn.	82	205	5,287	206,310	35,588	40,568
Newark, N. J.	69	324	11,538	500,896	58,734	154,460
Cleveland, Ohio	64	314	11,322	208,738	26,824	117,207
Rochester, N. Y.	56	237	9,314	478,702	11,781	300,621
Indianapolis, Ind.	51	309	7,851	116,429	10,353	161,102
Haverhill, Mass.	51	76	5,271	97,289	6,660	78,495
Minneapolis, Minn.	50	169	7,615	167,524	18,399	189,400
Paterson, N. J.	47	117	22,326	1,019,768	26,757	555,200
Buffalo, N. Y.	46	408	14,079	459,758	19,950	818,015
Jersey City, N. J.	46	118	7,819	90,020	1,330	12,275
St. Paul, Minn.	45	255	22,475	780,325	24,520	1,017,795
Troy, N. Y.	42	128	3,649	68,081	3,769	39,802
Total	5,909	28,662	955,250	$24,988,100	$4,590,177	$28,786,446

Summary of Lockouts in the Principal Cities, January 1, 1887, to June 30, 1894.

[In the case of many general lockouts extending through different cities it was found impossible to subdivide the facts and credit them to the several cities involved. In such cases the whole lockout has generally been tabulated against the city most largely affected.]

City.	Total lockouts.	Establishments.	Employés thrown out of employment.	Wage loss of employés.	Assistance to employés by labor organization.	Loss of employers.
New York, N. Y.	43	393	19,959	$587,301	$83,112	$370,442
Boston, Mass.	19	128	3,072	212,434	40,450	97,111
Chicago, Ill.	18	1,151	48,612	3,576,317	70,050	2,789,910
Allegheny and Pittsburg, Pa.	15	385	11,572	5,353,764	250,025	727,959
Philadelphia, Pa.	14	82	9,262	447,958	62,585	510,575
Cincinnati, Ohio	13	96	3,908	211,375	27,508	60,339
San Francisco, Cal.	12	42	776	67,768	13,170	18,200
Haverhill, Mass.	10	57	7,496	101,606	5,900	60,400
St. Paul, Minn.	10	55	1,056	30,780	8,303	46,150
Brooklyn, N. Y.	9	64	2,360	68,424	6,092	131,225
St. Louis, Mo.	8	42	1,006	217,347	45,249	48,140
Milwaukee, Wis.	7	25	752	245,755	12,375	505,600
Minneapolis, Minn.	7	7	1,650	28,350	2,828	26,100
Indianapolis, Ind.	6	116	1,185	65,224	900	20,000
Rochester, N. Y.	6	81	18,271	462,260	3,159	205,545
Richmond, Va.	6	15	117	19,508	2,274	650
Buffalo, N. Y.	5	30	990	72,488	365	13,670
Seattle, Wash.	5	23	428	19,600	2,628	4,040
Detroit, Mich.	5	11	1,264	56,201	14,642	5,500
Springfield, Mass.	5	8	208	1,230		11,755
New Haven, Conn.	5	8	64	3,344	840	15,725
Baltimore, Md.	5	6	239	7,240	2,684	7,950
Newark, N. J.	4	49	2,974	139,586	12,350	29,700
Woburn, Mass.	4	19	1,577	78,646	4,829	45,600
Albany, N. Y.	3	77	1,512	42,267		12,000
Total	244	2,970	140,185	$12,108,463	$371,818	$5,754,286

In the case of both strikes and lockouts the cities shown are the 26 in which the greatest number of these disturbances occurred during the period included in the report. It will be noticed that the cities are practically the same in both classes of disturbances, only 6 cities in each table being different.

Considering the table for strikes, it is seen that out of a total of 10,487 strikes for the entire country 5,909, or 56.35 per cent, occurred in the 26 cities included in that table. The number of establishments involved in strikes in the United States during the period was shown as 46,862, of which number 28,662, or 61.16 per cent, occurred in the 26 cities. The wage loss to employés through strikes in the 26 cities was $34,988,100, as against $111,992,934 for the entire country, and the loss to employers $28,786,446, as against $51,888,233. These 26 cities contained 34.26 per cent of all the manufacturing establishments and employed 38.88 per cent of the capital invested in the mechanical industries of the United States, taking the census of 1890 as the basis of computation. Seven of the 26 cities, New York, Brooklyn, Chicago, Boston, Allegheny, Pittsburg, and Philadelphia, reported 4,561 strikes, or 43.49 per cent of all the strikes which occurred in the United States during the period involved, and 22,248 establishments, or 47.48 per cent, of the whole number of establishments involved.

Of the 22,304 establishments involved in strikes during the six years covered by the Third Annual Report, 1881 to 1886, as was there shown, the strikes in 18,342, or 82.24 per cent of the whole, were ordered by labor organizations, while of the 2,214 establishments in which lockouts occurred, 1,753, or 79.18 per cent, were ordered by combinations of employers. The facts for the seven and one-half years from January 1, 1887, to June 30, 1894, are as follows: Excluding from consideration seven strikes for which no report touching this point could be secured, 7,294, or 69.60 per cent of the whole number of strikes (10,480), were ordered by labor organizations, while of the 442 lockouts occurring during this period but 81, or 18.33 per cent, were ordered by an employer's organization. It will be noticed in the preceding statement, that for the former period the establishment forms the basis of the percentages, while for the latter the strike or lockout forms the basis. This is unavoidable, owing to the difference in the tabulation of the facts for this point in the two reports. It does not, however, materially affect the comparableness of the percentages. Bearing this in mind, the facts for each year in this respect may be clearly seen in the percentage table which follows:

Strikes and Lockouts Ordered by Organizations, January 1, 1881, to June 30, 1894.

Year.	Strikes (per cent).	Lockouts (per cent).	Year.	Strikes (per cent).	Lockouts (per cent).
1881	75.58	22.22	1888	68.14	20.00
1882	76.01	26.19	1889	67.35	11.11
1883	83.98	41.03	1890	71.33	14.06
1884	82.85	79.10	1891	74.83	13.04
1885	70.93	71.58	1892	70.72	22.95
1886	87.53	84.89	1893	69.48	21.43
1887	66.34	25.37	1894 (6 months)	63.80	14.29

Combining the facts for the period involved in the Third Annual Report with those for the period included in the Fourth report, the following table shows, by years, in the form of percentages, the proportion of the establishments involved in both strikes and lockouts which were closed in consequences of such disturbances:

Establishments Closed, January 1, 1881, to June 30, 1894.

Year.	Strikes (per cent).	Lockouts (per cent).	Year.	Strikes (per cent).	Lockouts (per cent).
1881	55.81	33.33	1889	61.89	59.69
1882	54.01	59.52	1890	56.25	62.39
1883	63.57	58.12	1891	56.65	65.98
1884	64.72	37.85	1892	65.60	66.90
1885	71.58	79.23	1893	65.64	40.98
1886	58.24	67.98	1894 (6 months)	60.50	14.91
1887	57.55	83.84			
1888	53.45	55.00	Total	59.56	63.90

Referring to the Third Annual Report it is seen that from 1881 to 1886, inclusive, of the 22,304 establishments subjected to strikes, 13,411, or 60.13 per cent, were temporarily closed, and of the 2,214 establishments in which lockouts occurred, 1,400, or 63.23 per cent, were closed. The duration of stoppage, or the average days closed for strikes, was 23 days, and for lockouts 28.4 days. The facts as shown in the present report for the seven and one-half years from January 1, 1887, to June 30, 1894, are that of 46,862 establishments subjected to strikes, 27,786, or 59.29 per cent, were closed, 42 being closed permanently or having strikes still pending July 1, 1894, the remainder being only temporarily closed; while of the 3,853 establishments involved in lockouts, 2,477, or 64.29 per cent, were closed, 23 being closed permanently or having lockouts still pending July 1, 1894, the remainder being only temporarily closed. The average days closed on account of strikes, excluding the 42 above mentioned, was 22.3 days, and on account of lockouts, excluding the 23 above mentioned, 35.4 days. Combining the facts for the two periods, as shown in the total of the preceding figures, it is seen that during the thirteen and one-half years from January 1, 1881, to June 30, 1894, out of a total of 69,166 establishments in which strikes occurred, 41,197, or 59.56 per cent, were closed, while of the 6,067 establishments subjected to lockouts, 3,877, or, 63.90 per cent, were closed. The duration of stoppage, or days closed, in the 41,155 establishments which were temporarily closed was 22.5 days, while in the 3,854 establishments temporarily closed by reason of lockouts the average time closed was 32.8 days.

The duration of strikes or lockouts themselves—that is, the average length of time which elapsed before the establishments resumed operations and were running normally, either by reason of the strikers or em-employés locked out having returned to work or by their places having been filled by others—applies to all establishments, whether closed or not, and differs, of course, from the figures given for duration of entire stoppage of work, which applies only to establishments entirely closed. The following table shows the average duration, or days to date when strikers or employés locked out were reemployed or their places filled by others, for each of the years included in the Third Annual Report and the present one. A small number of establishments which were closed permanently in consequence of strikes or lockouts or in which strikes or lockouts were still pending have, of course, been omitted in computing the averages:

Duration of Strikes and Lockouts, January 1, 1881, to June 30, 1894.

[The duration involves the number of days from date of strike or lockout to date when employés returned to work, or when their places were filled by others.]

Year.	Strikes.		Lockouts.	
	Establishments.	Average duration (days).	Establishments.	Average duration (days).
1881	2,928	12.8	9	22.2
1882	2,105	21.9	42	105.0
1883	2,759	20.6	117	57.5
1884	2,367	30.5	354	41.4
1885	2,284	30.1	183	27.1
1886	10,053	23.4	1,509	39.1
1887	6,589	20.9	1,281	49.8
1888	3,506	20.3	180	74.9
1889	3,786	26.2	132	57.5
1890	9,424	24.2	324	73.9
1891	8,116	34.9	546	37.8
1892	5,540	23.4	716	72.0
1893	4,555	20.6	305	34.7
1894 (6 months)	5,154	37.8	369	18.7
Total	69,166	25.4	6,067	46.6

According to the previous report for the years 1881 to 1886, of the firms against whom strikes were instituted, 46.52 per cent granted the demands of their employés; in 13.47 per cent of the establishments partial success in attaining the objects for which the strikes were instituted was gained, while failure followed in 39.95 per cent of the establishments; a small number of establishments, constituting 0.06 per cent of the whole number, had strikes still pending January 1, 1887. In the lockouts during those years the firms gained their point in 25.47 per cent of the establishments; in 8.58 per cent they partially succeeded; in 60.48 per cent they failed, and in 5.47 per cent of the whole number of establishments involved the lockouts were still pending January 1, 1887.

For the period included in the present report, out of the whole number of establishments affected by strikes, viz., 46,862, success in their demands was gained by the employés in 20,397 establishments, or 43.52 per cent; partial success was gained in 4,775 establishments, or 10.19 per cent; and failure followed in 21,686 establishments, or 46.28 per cent of the whole number; for 4 establishments, or 0.01 per cent, either the results were not reported or the strikes were still pending July 1, 1894. Out of the 3,853 establishments having lockouts, 1,883, or 48.87 per cent of the whole number succeeded in gaining their demands; 391, or 10.15 per cent, partially succeeded, and 1,558, or 40.44 per cent, failed; in 21 establishments, or 0.54 per cent of the whole number, the lockouts were still pending July 1, 1894. The percentages for each of the years included in this and the preceding report are shown as follows:

Results for Establishments, January 1, 1881, to June 30, 1894.

Year.	Per cent of establishments in strikes which—			Per cent of establishments in lockouts which—		
	Succeeded.	Succeeded partly.	Failed.	Succeeded.	Succeeded partly.	Failed.
1881	61.37	7.00	31.63	88.89	11.11	....
1882	53.59	8.17	38.24	64.29	....	35.71
1883	58.17	16.09	25.74	56.41	....	43.59
1884	51.50	3.89	44.61	27.97	.28	71.75
1885	52.80	9.50	37.70	38.25	3.28	58.47
1886	*a* 34.45	*a* 18.82	*a* 46.58	*b* 19.48	*b* 12.08	*b* 60.44
1887	45.64	7.19	47.17	34.19	1.25	64.56
1888	52.22	5.48	42.30	74.44	3.89	21.67
1889	46.49	18.91	34.60	40.91	25.76	33.33
1890	*c* 52.64	*c* 10.01	*c* 37.34	65.74	5.56	28.70
1891	37.88	8.29	53.83	63.92	14.29	21.79
1892	39.31	8.70	51.99	69.13	25.28	5.59
1893	*d* 50.83	*d* 10.38	*d* 38.79	*e* 39.02	*e* 17.05	*e* 37.05
1894 (six months)	23.83	15.66	60.51	21.95	1.36	76.69
Total	*f* 44.49	*f* 11.25	*f* 44.23	*g* 40.33	*g* 9.58	*g* 47.75

a Not including 15 establishments in which strikes were still pending January 1, 1887.
b Not including 121 establishments in which lockouts were still pending January 1, 1887.
c Not including 1 establishment not reporting.
d Not including 3 establishments in which strikes were still pending July 1, 1894.
e Not including 21 establishments in which lockouts were still pending July 1, 1894.
f Not including 19 establishments for the reasons stated in notes *a*, *c* and *d*.
g Not including 142 establishments for the reasons stated in notes *b* and *e*.

For the thirteen and one-half years ending June 30, 1894, as shown by this table, out of a total of 69,166 establishments affected by strikes the employés were successful in gaining their demands in 30,772, or 44.49 per cent; they partly succeeded in 7,779, or 11.25 per cent, while in 30,596 establishments, or 44.23 per cent, they failed; in a very small number of establishments, constituting 0.03 per cent of all the establishments involved, the results of strikes were not obtainable. Of the 6,067 establishments in which lockouts occurred during the same period the firms gained their point in 2,447 establishments, or 40.33 per cent of the whole number involved; in 581, or 9.58 per cent, they were partly successful, while in 2,897, or 47.75 per cent, they failed; in the remaining 142, or 2.34 per cent of the establishments, the results of the lockouts were not obtainable.

The results of strikes from 1881 to 1886, so far as they concerned employés, as shown in the Third Annual Report, were as follows: The number of persons thrown out of employment in the 10,375 establishments having successful strikes was 518,583; in the establishments in which strikes were partially successful 143,976 employés were involved, while in the 8,910 establishments in which the strikes were failures 660,396 persons were thrown out of employment. The result of strikes in 15 establishments, involving 248 persons, were not reported. While the establishments in which strikes succeeded constituted 46.52 per cent of the establishments in which strikes occurred, the number of persons thrown out of employment in the successful strikes constituted but 39.19 per cent of the whole number of persons involved; the number of establishments involved in partly successful strikes was 13.47 per cent of all establishments, while the number of persons involved in such strikes was only 10.88 per cent of the whole number of persons. The number of establishments in which strikes failed constituted 39.95 per cent of the whole number, while 49.91 per cent of the number of persons thrown out of employment were involved in such strikes. The number of establishments in which the results of strikes were not reported constituted 0.06 per cent of the entire number, the number of persons thrown out of employment in such establishments being 0.02 per cent of the entire number of persons thrown out of employment.

The results for the succeeding seven and one-half years, from January 1, 1887, to June 30, 1894, so far as they concerned employés, as shown in the present report, are as follows: In the 20,397 establishments having successful strikes 669,942 persons were thrown out of employment; in the 4,775 establishments in which strikes were partly successful 318,801 employés were involved, while in the 21,686 establishments in which strikes failed 1,400,863 persons were thrown out of employment; the results were not reported in 4 establishments, in which 1,422 persons were involved. While the establishments in which strikes succeeded constituted 43.52 per cent of the establishments in which strikes occurred, the number of persons thrown out of employment in the successful strikes constituted 28.02 per cent of the whole number of persons involved; the number of establishments involved in partly successful strikes was 10.19 per cent of all establishments, while the number of persons involved in such strikes was 13.33 per cent of the whole number. The number of establishments in which strikes failed was 46.28 per cent of the whole number, while 58.59 per cent of the whole number of persons thrown out of employment were involved in such strikes. In 0.01 per cent of the entire number of establishments, including 0.06 per cent of the number of persons thrown out of employment, the result of strikes were not reported.

The following table combines the facts for the two reports, showing the results, so far as employés are concerned, for the strikes during an uninterrupted period of thirteen and one-half years, beginning January 1, 1881, and ending June 30, 1894:

Results of Strikes for Employés, January 1, 1881, to June 30, 1894.

Year.	Number thrown out of employment—				Per cent thrown out of employment—		
	In successful strikes.	In partly successful strikes.	In strikes which failed.	In total strikes.	In successful strikes.	In partly successful strikes.	In strikes which failed.
1881	55,600	17,482	56,439	129,521	42.93	13.50	43.57
1882	45,746	7,112	101,813	154,871	29.58	4.60	65.82
1883	55,140	17,021	77,599	149,763	36.82	11.37	51.81
1884	52,736	5,044	89,274	147,054	35.86	3.43	60.71
1885	115,375	23,855	103,475	242,705	47.54	9.83	42.63
1886	*a* 195,400	*a* 74,167	*a* 238,229	508,044	*a* 38.46	*a* 14.60	*a* 46.89
1887	127,579	26,442	225,655	379,676	33.60	6.97	59.43
1888	41,106	11,130	95,468	147,704	27.83	7.54	64.63
1889	72,099	62,607	114,853	249,559	28.89	25.09	46.02
1890	*b* 158,787	*b* 48,444	*b* 144,681	351,944	*b* 45.12	*b* 13.76	*b* 41.11
1891	80,766	22,885	195,288	298,939	27.02	7.65	65.33
1892	61,125	16,429	129,117	206,671	29.58	7.95	62.47
1893	*c* 62,018	*c* 41,765	*c* 160,741	265,914	*c* 23.32	*c* 15.71	*c* 60.45
1894 (6 months)	65,048	88,391	328,627	482,066	13.49	18.34	68.17
Total	*d* 1,188,525	*d* 462,777	*d* 2,061,259	3,714,281	*d* 32.00	*d* 12.46	*d* 55.50

a Not including 248 engaged in strikes still pending January 1, 1887.
b Not including 32 engaged in strikes not reporting result.
c Not including 1,390 engaged in strikes still pending July 1, 1894.
d Not including 1,670 for the reasons stated in the preceding notes.

The totals, as given in this table, show that the number of persons thrown out of employment in the 30,772 establishments having successful strikes was 1,188,525. In the 7,779 establishments in which partial success was gained 462,777 employés were involved, while in the 30,596 establishments in which strikes failed 2,061,259 persons were thrown out of employment. The last three columns of the table show for each year, and for the thirteen and one-half years, the per cent of employés in establishments in which the strikes succeeded, partly succeeded, or failed. Taking the total for the period of thirteen and one-half years, it is seen that 32 per cent of the whole number of persons thrown out of employment succeeded in gaining the object for which they struck; 12.46 per cent succeeded partly, while 55.50 per cent, or over half of the whole number, failed entirely in gaining their demands. A small proportion of the whole number, 0.04 per cent, for the various reasons stated in the notes to the table, made no report as to the result.

The Third Annual report shows that for the years included therein, 1881 to 1886, 17 of the causes for which strikes were undertaken included 90.28 per cent of all the establishments, leaving the remaining 297 causes operative in only 9.72 per cent of the establishments in which strikes occurred. Even 4 leading causes were found to cover 77.16 per cent of the establishments. The following table was there given as clearly bringing out these facts.

Leading Causes of Strikes, January 1, 1881, to December 31, 1886.

Cause or object.	Establishments.	Per cent.
For increase of wages	9,439	42.32
For reduction of hours	4,344	19.48
Against reduction of wages	1,734	7.77
For increase of wages and reduction of hours	1,692	7.59
For reduction of hours and against being compelled to board with employer	800	3.59
For change of hour of beginning work	360	1.61
For increase of wages and against the contract system	238	1.07
For increase of wages and against employment of non-union men	215	.96
In sympathy with strike elsewhere	173	.77
For 9 hours' work with 10 hours' pay	172	.77
Against employment of non-union men, foremen, etc	162	.73
For increase of wages and recognition of union	145	.65
For adoption of union, etc., scale of prices	142	.64
Against increase of hours	138	.62
For increase of wages and enforcement of union indenture rules	132	.59
For reduction of hours and wages	126	.56
For reinstatement of discharged employés, foremen, etc.	124	.56
Total of 17 leading causes	20,136	90.28
All other causes (297)	2,168	9.72
Total for the United States	22,304	100.00

An examination of the causes for which strikes were undertaken during the period of seven and one-half years, shows that the 17 principal causes included 81.27 per cent of all the establishments, leaving the remaining 574 causes active in only 18.73 per cent of the establishments subjected to strikes during the period. Five of the leading causes included a very large proportion of all establishments, the per cent being 61.42 of the whole number involved. The following table, showing the number and per cent of establishments falling under each of the 17 principal causes during the period of seven and one-half years brings out these percentages in detail:

Leading Causes of Strikes, January 1, 1887, to June 30, 1894.

Cause or object.	Establishments.	Per cent.
For increase of wages	12,041	25.69
For reduction of hours	6,199	13.23
Against reduction of wages	3,830	8.17
In sympathy with strike elsewhere	3,620	7.73
For increase of wages and reduction of hours	3,095	6.60
Against employment of non-union men	1,688	3.60
For adoption of new scale	1,559	3.33
For recognition of union	1,314	2.80
For adoption of union scale	844	1.80
For adoption of union rules and union scale	783	1.67
For increase of wages and recognition of union	686	1.46
To compel World's Fair directors to employ none but union men in building trades	472	1.01
For reinstatement of discharged employés	467	1.00
For payment of wages overdue	383	.82
For increase of wages and reduction of hours on Saturday	378	.81
Against being compelled to board with employer, and for reduction of hours and recognition of union	366	.78
For increase of wages according to agreement	359	.77
Total of 17 leading causes	38,084	81.27
All other causes (574)	8,778	18.73
Total for the United States	46,862	100.00

One of the most important features of the tabulation is the statement of the losses of the employés and of the employers by reason of strikes and lockouts. These figures were collected with the greatest possible care, and although in many cases only an estimate could be secured the results as given are believed to be a very close approximation to the exact losses. It is natural to suppose that after the lapse of several years exact figures could not be secured concerning facts of which no record is kept in most instances. The figures here given are for the immediate, and in many instances only temporary, losses of employés and employers. In most businesses there are seasons of entire or partial idleness among the employés, owing to scikness, voluntary lay-offs, running slack time, etc., the working days per year being on an average from 200 to 250 days out of a possible 313. When a strike or lockout occurs in an establishment whose business is of such a character it is often followed by a period of unusual activity in which the employé and employer both make up time lost by reason of the temporary cessation of business on account of the strike. The employer may in some instances be subjected to an ultimate loss by reason of his inability to fill contracts already made, but it may be accepted as a fact that much of the loss in the cases of both employer and employé is only temporary. It was found impossible, however, for the agents of the Department to take these facts into consideration, inasmuch as in many instances a period of six months or even a year must have elapsed before the whole or even a part of such loss was made up. The computation of wage loss has therefore been based on the number of employés thrown out of employment, their average wages, and the number of working days which elapsed before they were re-employed or scured work elsewhere. The amounts representing employers' losses are the figures (in most cases estimates) furnished by the firms themselves, the Department's agents being instructed to consider, as well as they could, their probable correctness. In the summaries by years the figures can not represent absolute accuracy for a given year, because many strikes beginning in one year ended in another; the entire loss and assistance, as well as the other facts included in the tabulation, have been placed in the year in which the strike or lockout began. These differences may, however, counterbalance each other and the reported results thus be nearly accurate.

Bearing in mind, then the difficulties in ascertaining the exact losses of employés and employers as a result of strikes and lockouts, reference may be had to the following table showing the amount of loss to employés and to employers, and the amount of assistance granted employés by their labor organizations, for a period of thirteen and one-half years, from January 1, 1881, to June 30, 1894.

Wage Loss of Employés, Assistance to Employés, and Loss of Employers, January 1, 1881, to June 30, 1894.

Year.	Strikes.			Lockouts.		
	To date when strikers were re-employed or employed elsewhere.		Loss of employers.	To date when employés locked out were re-employed or employed elsewhere.		Loss of employers.
	Wage loss of employés.	Assistance to employés by labor organizations.		Wage loss of employés.	Assistance to employés by labor organizations.	
1881	$3,372,578	$287,999	$1,919,483	$18,519	$3,150	$6,960
1882	9,864,228	734,339	4,269,094	466,345	47,668	112,382
1883	6,274,480	461,233	4,696,027	1,069,212	102,253	297,097
1884	7,656,717	407,871	3,393,073	1,421,410	314,027	640,847
1885	10,663,248	465,827	4,388,893	901,173	89,488	455,477
1886	14,992,453	1,122,130	12,357,808	4,281,058	549,452	1,949,498
1887	16,560,534	1,121,554	6,698,495	4,233,700	155,846	2,819,736
1888	6,377,749	1,752,668	6,509,017	1,100,057	85,931	1,217,199
1889	10,409,686	592,017	2,936,752	1,379,722	115,389	307,125
1890	13,875,338	910,285	5,135,404	957,966	77,210	486,258
1891	14,801,505	1,132,557	6,176,688	888,709	50,195	616,888
1892	10,772,622	833,874	5,145,691	2,856,013	587,684	1,695,080
1893	9,938,048	563,183	3,406,195	6,659,401	364,368	1,084,420
1894 (6 months)	28,238,471	528,869	15,557,166	457,231	31,737	596,484
Total	$163,807,657	$10,914,406	$82,589,786	$26,685,516	$2,524,298	$12,235,451

The loss to employés in the establishments in which strikes occurred, for the period of thirteen and one-half years, was $163,807,657. The loss to employés through lockouts for the same period was $26,685,516; or a total loss to employés by reason of these two classes of industrial disturbances of $190,493,173. The number of establishments involved in strikes during this period was 69,166, making an average loss of $2,368 to employés in each establishment in which strikes occurred. The number of persons thrown out of employment by reason of strikes was 3,714,231, making an average loss of $44 to each person involved. The number of establishments involved in lockouts was 6,067, making an average loss of $4,398 to employés in each establishment in which lockouts occurred, while the number of employés thrown out was 366,690, making an average loss of $73 to each person involved. Combining the figures for strikes and lockouts it is seen that the wage loss to employés, as above stated, was $190,493,173, and the number of establishments involved, 75,233, while 4,080,921 persons were thrown out of employment. These figures show an average wage loss of $2,532 to the employés in each establishment, and an average loss of $47 to each person involved.

The assistance given to strikers during the thirteen and one-half years, so far as ascertainable, was $10,914,406; to those involved in lockouts, $2,524,298, or a total sum of $13,438,704. This sum represents but 7.05 per cent of the total wage loss incurred in strikes and lockouts, and is probably too low. In addition to this sum, which includes only assistance from labor organizations, much assistance was furnished by outside sympathizers, the amount of which the Department had no means of ascertaining.

The loss to employers through strikes during the thirteen and one-half years amounted to $82,589,786; their losses through lockouts amounted to $12,235,451, making a total loss to the establishments or firms involved in strikes and lockouts during this period of $94,825,237.

PART VI.

DECISIONS OF COURTS AFFECTING LABOR.

The National Department of Labor has issued bi-monthly bulletins from that department, containing among other matters decisions of the courts affecting labor. This Bureau gave these decisions, so far as published, in its last report. The most important decisions rendered in the past year are published in this report. Space will not permit more than this. Among the decisions is one from the Michigan Supreme Court sustaining the Blower Law, passed at the 1887 session of the Legislature.

DECISIONS UNDER STATUTORY LAW.

CONSTITUTIONALITY OF MECHANIC'S LIEN LAW.—The constitutionality of the mechanic's lien law of Indiana was called in question, and its validity was sustained by the supreme court of the State, November 19, 1895, in the case of Smith et al. *v.* Newbauer et al., reported in volume 42 of the Northwestern Reporter, page 40.

An action was brought by John A. Newbauer and others against Henry B. Smith and others for the foreclosure of a mechanic's lien. From a judgment in favor of the plaintiffs by the circuit court of Blackford County, the defendants appealed to the supreme court, basing the appeal on the ground, among others, that the circuit court erred in overruling their demurrer to the complaint. In passing upon the validity of the statute Chief Justice Howard, delivering the opinion of the court, said:

In support of the demurrer to the complaint it is first contended that the mechanic's lien law of this State is invalid, as repugnant to section 1, article 14, of the Constitution of the United States, which provides that no State shall deprive any person of life, liberty, or property without due process of law. This contention is based upon the provisions of section 3 of the mechanic's lien law (sec. 7257, Rev. Stat., 1894; sec. 1690, Elliott's Supp.), which provides that any person wishing to acquire such a lien upon any property shall file in the recorder's office, "at any time within sixty days after performing such labor or furnishing such materials," notice of his intention to hold such lien. This notice—the only one provided for in the statute—is insufficient, say counsel, to secure that due process of law referred to by the Federal Constitution before the fixing of a lien upon the citizen's property. Under the law as enacted, counsel contend, anyone may perform labor or furnish material in the construction of a building for a landowner, without such owner's knowledge or consent, and then secure a lien upon the land and building by notice filed after the work is done or materials furnished. It is said that the property owner should have notice at or before the doing of the work or the supplying of the materials, so that he may, if he wishes, prevent the doing of such work or the furnishing of such materials, and so keep his property free of the lien.

It has often been held that every statute under which a contract is made enters into and forms a part of such contract. The appellants, in the contract for the erection of the dwelling house upon their property, are therefore chargeable with knowledge of, and are bound by, all the provisions of our mechanic's lien law then in force. By the terms of the agreement entered into, the contractors were to furnish all materials necessary for the construction of the building. This was notice that such materials were to be furnished; and the law under which the contract was made was further notice that the building and ground upon which it was to be erected would be liable to a lien for the value of the materials so furnished. The only uncertainty left was whether those who should furnish the material would claim the lien therefor. That uncertainty is provided for in the statute, which requires that the notice of intention to hold the lien be filed in the recorder's office within sixty days. The owner has, consequently, ample means of protection, and is not liable to a lien without notice, nor to have his property taken without due process of law.

It is intimated that the law hampers the freedom of action of the property owner; that he may desire to pay the contractor in advance, or to pay him by an exchange of other property for the erection of the buildings; and that it may be an inconvenience, or induce the contractor to bid higher for the work, if payment is to be delayed for sixty days after the work is done. These, however, are considerations that should be addressed to the legislature and not to the courts. Besides, it is to be remembered that without the right to a lien on the property laborers and material men would in many cases have no security for their toil or the materials furnished by them. The laborer is worthy of his hire, and the seller of goods ought to be paid for them. As the law stands, all parties are secured in their rights. The owner, by seeing that laborers and material men are paid, or by keeping back for sixty days from the contractor sufficient to make such payment, is in no danger of having to pay twice for his building; while at the same time the man whose labor or materials have gone into the building can look to the building itself, and to the ground upon which it stands, for his security. The property owner enjoys the benefit of this work and of this material, and it is but just that he should be charged for at least sixty days, with the responsibility of seeing that they are paid for.

CONSTITUTIONALITY OF PROPOSED LAW REGULATING THE PAYMENT OF WAGES.—By resolution of the house of representatives of the legislature (general court) of Massachusetts, the supreme judicial court of that State was required to give its opinion upon the following important question of of law: "Is it within the constitutional power of the legislature to extend the application of the present law, relative to the weekly payment of wages by corporations, to private individuals and partnerships, as provided in the bill entitled 'An act relative to the weekly payment of wages,' now pending before the general court?"

The opinion of the court, given in reply to the above question, on May 6, 1895, was to the effect that under part 2, chapter 1, section 1, article 4, of the State constitution, which provides that full power and authority shall be given to the general court to make and ordain all manner of wholesome and reasonable laws, so as the same be not repugnant or contrary to the constitution, as they shall judge to be for the good of the Commonwealth, the legislature has power to extend the application of the present law, relative to the weekly payment of wages by corporations, to individuals and partnerships, and that such legislation is not in conflict with the declaration of rights (articles 1, 12) nor with the fourteenth amendment to the Constitution of the United States.

In the course of the opinion, which is reported in full in volume 40 of the Northeastern Reporter, page 713, the court said:

Your question implies that in your opinion the present law relating to the weekly payment of wages by certain corporations to their employés is constitutional, and your inquiry is whether it is within the constitutional power of the legislature to extend the law to private individuals and to partnerships.

We are not informed of the nature of the doubts which your request implies. It is well known that in some of the States of this country legislation similar to that proposed has been held unconstitutional by the courts, sometimes on the ground that it is partial in its character, but more frequently on the ground that it interferes with what is called the liberty of contract, which, it is said, either as a privilege or as property, is secured to the inhabitants of a State by its constitution, or by the Constitution of the United States.

The legislative power granted to the general court by the constitution of Massachusetts is perhaps more comprehensive than that found in the constitutions of some of the other States. The constitution of Massachusetts (part 2, chap. 1, sec. 1, art. 4) provides as follows: "And further, full power and authority are hereby given and granted to the said general court, from time to time, to make, ordain, and establish all manner of wholesome and reasonable orders, laws, statutes, and ordinances, directions and instructions, either with penalties or without, so as the same be not repugnant or contrary to this constitution, as they shall judge to be for the good and welfare of this Commonwealth, and for the government and ordering thereof, and of the subjects of the same, and for the necessary support and defense of the government thereof," etc. There is not in the constitution of Massachusetts anything which in terms relates to the freedom or liberty of contract, as there is concerning the liberty of the press. The constitution declares that "all men are born free and equal, and have certain natural, essential, and unalienable rights; among which may be reckoned the right of enjoying and defending their lives and liberties; that of acquiring, possessing, and protecting property; in fine, that of seeking and obtaining their safety and happiness;" and it is also declared that "no subject shall be arrested, imprisoned, despoiled, or deprived of his property, immunities, or privileges, put out of the protection of the law, exiled, or deprived of his life, liberty, or estate, but by the judgment of his peers, or the law of the land." (Declaration of Rights, articles 1, 12.) This last declaration was taken from Magna Charta, and in substance it has been incorporated in the fourteenth amendment of the Constitution of the United States, in form as follows: "No State shall make or enforce any laws which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law, nor deny to any person within its jurisdiction the equal protection of the laws."

There has never been at any time in Massachusetts an absolute right in its inhabitants to make all such contracts as they pleased. Some contracts have always been held void at common law, and some contracts valid at common law have been declared void by statute. Our statute of frauds prevents the enforcement in the courts of many kinds of contracts, unless they are shown by a writing, and prohibits the making of certain contracts, and this statute was passed for the protection of persons against fraud and perjury. Seamen have sometimes been regarded as a class of persons who could not be trusted to make their own contracts without supervision, and statutes have been passed making regulations concerning their wages and shipping contracts. (Rev. Stat. U. S., tit. 53.) Wages to a certain amount due for personal labor and services have been exempt from attachment, probably on the ground that it was thought that workmen generally need their wages for their support. Usury laws furnish perhaps the best known illustration of the regulation by statute of the price to be paid for the use of a commodity, but the validity of these laws usually has been regarded as an exception to the general rule. Rev. Stat. Mass., tit. 12, entitled "Of the regulation of trade in certain cases," show various forms of interference by the legislature with what may be called the freedom of trade or of contracts concerning the sale of commodities. The regulation of the subject of fire insurance, and the prohibition of the sale of oleomargarine made in imitation of yellow butter, and the requirement that an agreement to make a will must be in writing, are some of the most recent instances in Massachusetts of the prohibition or regulation of contracts by statute. The constitutionality of much of this legislation has never been questioned, and, when questioned, it generally has been sustained.

In Frisbie *v.* United States, 15 U. S. Supreme Court, 586, that court says: "While it may be conceded that, generally speaking, among the inalienable rights of the citizen is that of the liberty of contract, yet such liberty is not absolute and universal. It is within the undoubted power of the Government to restrain some individuals from all contracts, as well as all individuals from some contracts. It may deny to all the right to contract for the purchase or sale of lottery tickets; to the minor the right to assume any obligations, except for the necessaries of existence; to the common carrier the power to make any contract releasing himself from negligence; and, indeed, may restrain all engaged in any employment from any contract in the course of that employment which is against public policy. The possession of this power by Government in no manner conflicts with the proposition that, generally speaking, every citizen has a right freely to contract for the price of his labor, services, or property."

The decisions of various courts of this country upon the authority of the legislature of a State to prescribe rates for transportation by railroad companies, and in some instances for the use of elevators, have proceeded on the ground that these were public employments; and it is implied in all or nearly all of these decisions that the legislature could not constitutionally prescribe the rates of compensation to be paid for services or for the use of property in exclusively private employments. It is manifest, however, from the examples we have given that the regulation of contracts by statute, not amounting to a determination of rates or prices, has not been confined to public employments, or to business which may be said to be affected with a distinct public interest. The legislation on this subject relates to a great variety of contracts, and has been passed, some of it to promote the public health or public morals or the public convenience, some of it for the protection of individuals against fraud, and some of it for the protection of classes of individuals against unfair or unconscionable dealing. The considerations which may influence the legislature to determine what legislation of this character is required by good public policy, or in the words of the constitution, what laws are "for the good and welfare of this Commonwealth, and for the government and ordering thereof, and of the subjects of the same," are not for us to weigh, except so far as may be necessary to determine whether the legislation proposed is repugnant or contrary to the constitution. The legislation on similar subjects in Great Britain and in other foreign countries which have no written constitution limiting the powers of the legislature is not in all respects pertinent to the present inquiry; but, considering the history of legislation in England concerning servants or laborers from the earliest times, and the statutes which in modern times have been passed in several foreign countries and many of the States of this country regulating the employment of laborers in factories, we can not say, as matter of law, that the legislation proposed is so plainly not wholesome or reasonable that the general court may not judge it to be for the good and welfare of the Commonwealth. We know of no reason derived from the constitution of the Commonwealth or of the United States why there must be a distinction made in respect to such legislation between corporations and persons engaged in manufacturing, when both do the same kind of business. The existing statutes on the subject, relating to manufacturing corporations, we do not regard as having been passed necessarily in amendment of their charters. They relate to all the corporations described, whether there is any power reserved in the legislature to amend their charters or not, and they do not purport to have been passed for the purpose of restricting the corporate powers of the corporations.

Without attempting to define the limits of the power of the general court in Massachusetts to control the right of its inhabitants to make contracts generally, we can not say that a statute requiring manufacturers to pay the wages of their employés weekly is not one which the general court has the constitutional power to pass, if it deems it expedient to do so. We have not examined in detail the provisions of the bill referred to, nor considered whether the bill may not need amendment to make its meaning clear; but the question submitted, we think, should be answered in the affirmative.

CONSTITUTIONALITY OF ACT PROVIDING FOR ATTORNEYS' FEES IN SUITS FOR WAGES.—The constitutionality of the act of June 1, 1889, of Illinois, providing for taxing attorneys' fees as costs in actions brought by servants for wages which they have previously demanded in writing, was drawn in question in the case of Vogel et al. *v.* Pekoc (Northeastern Reporter, vol. 42, p. 386), and its validity was sustained by the supreme court of the State on June 15, 1895, the opinion of the court being delivered by Chief Justice Craig.

A petition for rehearing was filed which emphasized the previous contention that the act in question is a partial and special statute, working deprivation of property without due process of law, and therefore unconstitutional, and reliance was placed on decisions in a number of cases by the Illinois supreme court adverse to the constitutionality of certain legislative enactments as sustaining the position taken. On the rehearing, October 28, 1895, the court again sustained the validity of the law, Judge Magruder dissenting, and in their opinion said:

Those cases do not, however, control the present case, or decide the question here involved. Without discussing separately the facts of the cases relied upon, it may be said generally, that in each of those cases a principal and controlling question was the right of miners of coal (no less than their employers) to make contracts regulating the time and manner of the payment of wages and the method of computing such wages, and in each case cited a law restricting in some manner this important right of contract was held invalid.

The statute here in question interferes with no one's right to contract. It embraces a well defined class of cases and persons, not singled out, as is contended, wholly without reason and arbitrarily; but upon grounds which may, we think, properly serve as a basis for valid legislative action. Those to whom the wages of labor are due, and who, after demand in writing of a sum no greater than that subsequently recovered, are compelled to establish, and do establish, their rights as demanded by judgment of court, are within the provisions of the act; and we can not say that this classification is so arbitrary and unreasonable, and the law so partial and unequal, as to be beyond legislative discretion and power. Indeed, if this law were to be held unconstitutional for the reasons assigned, then many other acts long in force in this State, hitherto deemed to be salutary, and against which no constitutional objection has been heard, would certainly fall with it. Why, for instance, should the seller of materials for a building have by law a lien for their price, not only upon the specific things sold, but upon the whole structure, with the land it stands on, while the seller of a horse, a piano, or a cornsheller is denied any lien even on the specific thing sold? Why should he whose labor constructs a house be secured by a lien on his product, while he who raises a crop must look only to the personal responsibility of his hirer? Surely, it could be said the lien law makes classes of beneficiaries quite as arbitrary in character as that marked out to receive benefit by the act under discussion.

Again, why should the wages of a defendant, who is head of a family, to an amount not exceeding $50, be exempt from garnishment (Hurds St., p. 783, sec. 14), while sums due other defendants are protected by no such exemption? And why, again, it might be asked, should heads of families earning wages be made the subject of advantageous provisions not applied to all other wage earners if not to all other persons? The general exemption law also makes heads of families a distinct class, who may claim as exempt $300 worth more property than others are allowed, while a further section (id., p. 727, sec. 4) declares that where a judgment is for the wages of a laborer or servant, and noted by the court as such, no personal property whatever shall be free from levy, whatever the estate or condition of the debtor. An analogous case for this purpose is found in the provisions of the general assignment law that "all claims for the wages of any laborer or servant which have been earned within three months next preceding the making of the assignment," etc., "be preferred and first paid to the exclusion of all other demands" (id., p. 166, sec. 6). It is difficult to see how any of these statutes, and many similar ones which might be named, could be sustained if the strict rule of constitutional validity, so strenuously urged in this case, were applied to them.

In dissenting from the foregoing opinion Judge Magruder cited the case of Coal Co. *v.* Rosser (41 N. E., 263), in which the supreme court of Ohio had occasion to consider and condemn a statute similar to the one sustained by his colleagues. He said that the opinion in that case expressed what seemed to him to be the correct view of the subject, and made the following quotation therefrom as sufficiently indicating the reasons for his dissent:

Upon what principle can a rule of law rest which permits one party, or class of people, to invoke the action of our tribunals of justice at will, while the other party, or another class of citizens, does so at the peril of being mulct in an attorney's fee, if an honest but unsuccessful defense should be interposed? A statute that imposes this restriction upon one citizen, or class of citizens, only denies to him or them the equal protection of the law. It is true that no provision of the constitution of 1851 declares in direct and express terms that this may not be done; but nevertheless it violates the fundamental principles upon which our Government rests, as they are enunciated and declared by that instrument in the bill of rights. The first section of the constitution declares that the right to acquire, possess, and protect property is inalienable, and the next section declares, among other things, that "government is instituted for the equal protection and benefit" of every person, while section 16 of article 1 provides that "all courts shall be open, and every person, for an injury done him in his lands, goods, person, or reputation, shall have remedy by due course of law, and justice shall be administered without denial or delay." The right to protect property is declared, as well as that justice shall not be denied, and everyone is entitled to equal protection. Judicial tribunals are provided for the equal protection of every suitor. The right to retain property already in possession is as sacred as the right to recover it when dispossessed. The right to defend against an action to recover money is as necessary as the right to defend one brought to recover specific real or personal property. An adverse result in either case deprives the defeated party of property.

If the general assembly has power to enact the statute in question, it could also enact one providing that lawyers, doctors, grocers, or any other class of citizens might make out their accounts, demand in writing their payment within a short time, which, if not complied with, would entitle the plaintiff to an attorney fee in addition to his claim, if he recovered the amount demanded. We do not think the general assembly has power to discriminate between persons or classes respecting the right to invoke the arbitrament of the courts in the adjustment of their respective rights. The legislative power to compel an unsuccessful party to an action—generally the defendant—to pay an attorney fee to his opponent has received the attention of a number of courts of last resort as well as laws which impose as a penalty double damages or some similar penalty for some wrongful or negligent act injurious to another. Where the penalty has been imposed for some tortious or negligent act, the statute has generally, though not always, been sustained; but, on the contrary, where no wrongful or negligent conduct was imputed to the defeated party, any attempt to charge him with a penalty has not prevailed. [At this point in the decision a number of cases are cited as sustaining the foregoing propositions.] Various phases of this subject have received attention in the foregoing cases, as well as in some others to which we do not deem it necessary to refer. The general tendency of these authorities is toward the result which we have reached; but whether they do or do not support our conclusions, we are satisfied that the fundamental principles of government declared by our bill of rights clearly and unequivocally prohibit legislation of the character of that involved in this case.

CORPORATIONS—LIABILITY OF STOCKHOLDERS FOR WAGES.—Section 4161c8 of volume 3, Howell's Annotated Statutes of Michigan, provides that stockholders of manufacturing corporations "shall be individually liable for all labor performed for such corporations, which said liability may be enforced against any stockholder by action founded on this statute, at any time after an execution shall be returned unsatisfied in whole or in part against the corporation," etc.

Under this statute suit was brought before a justice of the peace by Ralph Kamp against Peter Wintermute, a stockholder in the Cheesman and Kelly Manufacturing Company, to recover for personal work and labor performed by Kamp for the company before Wintermute became a stockholder therein. The justice gave judgment for Kamp, and the cause was removed to the circuit court of Muskegon county by writ of certiorari and there the judgment of the justice was reversed. The case was then carried to the supreme court of Michigan, which affirmed the judgment of the circuit court, holding that the statute in question does not make a stockholder liable for labor performed before he became a stockholder.

The opinion of the supreme court was delivered by Judge Long, and is published in volume 65 of the Northwestern Reporter, page 570. In the course of the opinion Judge Long said:

It is conceded in this court that the defendant was not a stockholder in the corporation at the time the labor was performed; but, as shown on the trial before the justice, he was a stockholder at the time suit was commenced. The claim is that those who are stockholders in a corporation at the time of the commencement of an action against the corporation upon the labor claims are liable upon such demands, although not stockholders at the time corporate liability accrued; that such stockholders impliedly assume all the obligations which rested upon former holders as members of the company, and are liable to the same extent as the former holders.

Whether statutory liability attaches to a stockholder in respect of debts contracted before he became a member of the corporation, is a question turning upon the words of the statute. While the persons who were stockholders at the time the debt was contracted may be held liable, we think the liability is confined to such stockholders, and not to those who thereafter purchase. The stockholders mentioned in this section of the statute must be construed to mean those who were such at the time the liability attaches to the corporation, The statutes of many of the States prescribe when such liability is to attach. Our statute fixes no such time by any express words, but, by necessary implication, was not intended to apply to one who became a purchaser after liability was incurred.

The general doctrine seems to be that a stockholder does not avoid a statutory liability to creditors who were such at the time he transfers his stock; and there is good reason for holding the rule being thus settled that the transferee does not take the stock subject to such statutory liability.

CONSTITUTIONALITY OF LAW REQUIRING BLOWERS FOR EMERY WHEELS—*People v. Smith, 66 Northwestern Reporter, page 382.*—Act No. 136 of the session laws of Michigan of 1887, now sections 1690z1, 1690z2, and 1690z3 of the third volume of Howell's Annotated Statutes, as amended by act No. 111 of the session laws of 1893, reads as follows:

SECTION 1. All persons, companies, or corporations, operating any factory or workshop where emery wheels or emery belts of any description are used, either solid emery, leather, leather covered, felt, canvas, linen, paper, cotton, or wheels or belts rolled or coated with emery or corundum, or cotton wheels used as buffs, shall provide the same with blowers, or similar apparatus, which shall be placed over, beside or under such wheels or belts in such a manner as to protect the person or persons using the same from the particles of dust produced and caused threby, and to carry away the dust arising from, or thrown off by such wheels or belts while in operation, directly to the outside of the building or to some receptacle placed so as to receive and confine such dust: *Provided,* That grinding machines upon which water is used at the point of the grinding contact shall be exempt from the conditions of this act.

SEC. 2. Any such person or persons and the managers or directors of any such corporation who shall have [the] charge or management of such factory or workshop, who shall fail to comply with the provisions of this act, shall be deemed guilty of a misdemeanor, and upon a conviction thereof before any court of competent jurisdiction shall be punished by a fine not less than twenty-five dollars and not exceeding one hundred dollars, or imprisonment in the county jail not less than thirty days or exceeding ninety days, or both such fine and imprisonment in the discretion of the court.

SEC. 3. Nothing in this act shall apply to factories, sawmills, shingle mills, and workshops in which such wheels or belts are occasionally used and only by men not especially employed for that purpose.

Joseph N. Smith was convicted of a violation of this act and appealed to the supreme court of Michigan from judgment on a writ of certiorari from the justice's court in Detroit rendered in the circuit court of Wayne county. The supreme court rendered its decision March 3, 1896, sustaining the constitutionality of the act and affirming the judgment of the court below. The following is quoted from the opinion of the supreme court, delivered by Judge Hooker:

Counsel for the defendant assert that they care to raise but one question, viz., the constitutionality of this law. It is not disputed that the state may regulate the use of private property, when the health, morals, or welfare of the public demands it. Such laws have their origin in necessity.

Counsel say that this law is invalid because it does not apply to all, not even to all who have emery wheels, because some may use with water, and others may not work continuously. For the purposes of this case, it may be said that all persons who are given continuous employment over dry emery wheels are within the provisions of this act. This singles out no class, as it applies to all persons who use emery wheels in that manner. Necessarily the practical application is limited to those who engage in such business, but such is the case with many laws. All criminal laws apply only to those who choose to break them. This law applies to all who choose to use the emery wheel.

The legislature has seen fit to permit certain uses of the dry wheel without a blower, while in other cases it is required. This is competent, and is not class legislation as between operatives. It fixes the limits of use without a blower, and requires it after such limits are passed; but the rules apply to all.

The vital question in this case is the right of the State to require the employer to provide, and the employé to use, appliances intended for the protection of the latter. Laws of this class embrace provisions for the safety and welfare of those whom necessity may compel to submit to existing conditions involving hazards which they would otherwise be unwilling to assume. Among them are provisions for fire escapes, the covering or otherwise rendering machinery safe, the condition of buildings, ventilation, etc. In the main, where the necessity is obvious, they commend themselves to those who have at heart the welfare of their fellows, and should be upheld if they do not contravene private rights. The constitution secures to the citizen the rights of life, liberty, and private property, and, as the only value in the later consists in its use, it follows that the right to use private property is within the provision. There can, however, be no doubt that the use of private property may be regulated by law. No one would think of questioning the validity of laws regulating the manufacture, use, and sale of dangerous drugs or explosives, or laws designed to insure safety in railway travel. The inspection of boilers, fire escapes upon hotels, means of exit from churches and other buildings which the public are wont to frequent, are familiar instances of the exercise of the police power. These rules are defended upon the ground that they are necessary to the safety of the public; not the entire populace, but such persons as shall lawfully place themselves in a position requiring such protection.

Where the law is aimed at acts or conditions which threaten contagion, —as where sewers, disinfection, or quarantine is required,—the necessity of and the power to make such laws are obvious. But at first blush they may not be so apparent where there is no direct danger to others than the party whose business is sought to be regulated, and those with whom he contracts.

It is contended in this case that neither the public welfare nor health is involved, inasmuch as the protection sought to be afforded is limited to the individual employé, who, by his contract of employment, signifies a willingness to use the machine in its dangerous condition, and therefore can not be heard to complain.

It is the law that a manufacturer may provide inferior and even dangerous machinery, tools, and utensils; and enterprises more or less hazardous are common and lawful. Men may contract to use such machinery, or to perform dangerous service, and have no remedy if injured. But we are not aware that the police power is limited by such contracts.

As between the parties themselves, the contract may cut off legal redress for injuries sustained, but we are not satisfied that the authority of the state is limited to the protection of those who do not sustain contract relations with each other. In the absence of a law requiring fire escapes, one who works in a high building and is injured may be held to have assumed the risk incident to his employment, but we know of no rule which precludes the State from making a regulation requiring fire escapes to be placed upon high buildings, though the only object be to facilitate the escape of employés who are under contract to work there without such appliances for escape. Fire escapes in hotels and means of exit in theaters and public halls are required by law for the benefit of patrons, who are there by virtue of contract relations with the proprietor. So long as the rule is general, and the danger to the public—i. e., that portion of the public who are subjected to the danger—is clear, it is a proper subject for legislative intervention.

Certain cases bearing upon the subject under discussion are here cited in the opinion, which then goes on to say:

The trouble with these cases arises over the inability of the courts to fix a rigid rule by which the validity of such laws may be tested. Each law of the kind involves the questions: (1) Is there a threatened danger? (2) Does the regulation invade a constitutional right? (3) Is the regulation reasonable? In the present case no controversy is raised over the first of these. Hence we are not called upon to discuss it. As is implied by what has been said, the constitutional right to use property without regulation is plain, unless the public welfare requires its regulation. If the public welfare does require it, the right must yield to the public exigency. And it is upon this question of necessity that the third question depends.

All, then, seems to be embraced in the question of necessity. Unless the emery wheel is dangerous to health, there is no necessity, and consequently no power, to regulate it. Unless the blower is a reasonable and proper regulation, it is not a necessary one. Who shall decide the question and by what rule? Shall it be the legislature or the courts? And, if the latter, is it to be determined by the evidence in the case that happens to be the first brought, or by some other rule? Does it become a question of fact to be submitted to the jury or decided by the court?

There is a manifest absurdity in allowing any tribunal, either court or jury, to determine from the testimony in the case the question of the constitutionality of the law. Whether this law invades the rights of all the persons using emery wheels in the State is a serious question. If it is a necessary regulation, the law should be sustained, but, if an unjust law, it should be annulled. The first case presented might show, by the opinions of many witnesses, that the use of the dry emery wheel is almost necessarily fatal to the operative, while the next might show exactly the opposite state of facts. Manifestly, then, the decision could not settle the question for other parties, or the fate of the law would depend upon the character of the case first presented to the court of last resort, which would have no means of ascertaining whether it was a collusive case or not, or whether the weight of evidence was in accord with the truth.

It would seem, then, that the questions of danger and reasonableness must be determined in another way. The legislature, in determining upon the passage of the law, may make investigations which the courts cannot. As a rule, the members (collectively) may be expected to acquire more technical and experimental knowledge of such matters than any court can be supposed to possess, both as to the dangers to be guarded against and the means of prevention of injury to be applied and hence, while under our institutions the validity of laws must be finally passed upon by the courts, all presumptions should be in favor of the validity of legislative action. If the courts find the plain provisions of the constitution violated, or if it can be said that the act is not within the rule of necessity in view of facts of which judicial notice may be taken, then the act must fall; otherwise it should stand. Applying this test, we think the law constitutional, and the judgment is therefore affirmed.

SUNDAY LABOR—BARBERS—CONSTITUTIONALITY OF STATUTE—*Ex parte Jentzsch, 44 Pacific Reporter, page 803.*—This case was brought before the supreme court of California on a petition by Leo Jentzsch for a writ of habeas corpus to secure his discharge from custody under a conviction for violation of section 310½ of the Penal Code, prohibiting barbers from keeping open their places of business or working at their trade on Sundays after 12 o'clock noon. The court rendered its decision April 17, 1896, declaring the above section unconstitutional, and from its opinion, delivered by Judge Henshaw, the following is quoted:

Petitioner was convicted under section 310½ of the Penal Code, which is a new section enacted in 1895, and which provides as follows: "Every person who as proprietor, manager, lessee, employé, or agent keeps open or conducts, or causes to be kept open or conducted, any barber shop, bath house and barber shop, barber shop of a bathing establishment, or hair-dressing establishment, or any place for shaving or hair-dressing used and conducted in connection with any other place of business or resort, or who engages at work or labor as a barber in any such shop or establishment on Sunday, or on a legal holiday, after the hour of 12 m. of said day, is guilty of a misdemeanor."

It is contended that the section is a violation of the following constitutional provisions:

Article 1, § 1: "All men are by nature free and independent, and have certain inalienable rights, among which are those of enjoying and defending life and liberty; acquiring, possessing and protecting property; and pursuing and obtaining safety and happiness."

Article 1, § 21: "No special privileges or immunities shall ever be granted which may not be altered, revoked or repealed by the legislature; nor shall any citizen, or class of citizens, be granted privileges or immunities which, upon the same terms, shall not be granted to all citizens."

Article 4, § 25, subsecs. 2, 33: "The legislature shall not pass local or special laws in any of the following enumerated cases, that is to say: Second, For the punishment of crimes and misdemeanors." "In all cases where a general law can be made applicable."

In construing so-called "Sunday laws" courts have variously regarded them, some from a religious view, others from a secular, and still others from an anomalous commingling of both. In this State they have never been upheld from a religious standpoint. Under a constitution which guarantees to all equal liberty of religion and conscience, any law which forbids an act not in itself contra bonus mores, because that act is repugnant to the beliefs of one religious sect, of necessity interferes with the liberty of those who hold to other beliefs or to none at all. Liberty of conscience and belief is preserved alike to the followers of Christ, to Buddhist, and Mohammedan, to all who think that their tenets alone are illuminated by the light of divine truth; but it is equally preserved to the sceptic, agnostic, atheist, and infidel who says in his heart "There is no God." So it has come to be the established rule in this State to view and construe such laws as civil and secular enactments. Thus construed, these laws, when decreed valid, are upheld as a proper exercise of the police power, as an exercise of the legislative prerogative to regulate the relations, contracts, intercourse and business of society at large, and its particular members with respect to each other. Herein it is held that the legislature may pass laws for the preservation of health and the promotion of good morals—propositions which are indisputable.

Says Mr. Justice Field, in Ex parte Newman, 9 Cal. 518: "Labor is a necessity, imposed by the conditions of our race, and to protect labor is the highest office of our laws." It is this language which respondent quotes and relies upon in support of the validity of this penal statute. Upon the question thus presented of the proper limits of the police power much might be written, and much, indeed, will have to be written, ere just bounds are set to its exercise. But in this case neither time permits nor necessity demands the consideration. Still it may be suggested in passing that our government was not designed to be paternal in form. We are a self-governing people, and our just pride is that our laws are made by us as well as for us. Every individual citizen is to be allowed so much liberty as may exist without impairment of the equal rights of his fellows. Our institutions are founded upon the conviction that we are not only capable of self-government as a community, but, what is the logical necessity, that we are capable, to a great extent, of individual self-government. If this conviction shall prove ill founded, we have built our house upon sand. The spirit of a system such as ours is therefore at total variance with that which, more or less veiled, still shows in the paternalism of other nations.

It may be injurious to health to eat bread before it is twenty-four hours old, yet it would strike us with surprise to see the legislature making a crime of the sale of fresh bread. We look with disfavor upon such legislation as we do upon the enactment of sumptuary laws. We do not even punish a man for his vices, unless they be practiced openly, so as to lead to the spread of corruption or to breaches of the peace or to public scandal. In brief, we give to the individual the utmost possible amount of personal liberty, and, with that guaranteed him, he is treated as a person of responsible judgment, not as a child in his nonage, and is left free to work out his destiny as impulse, education, training, heredity, and environment direct him. So, while the police power is one whose proper use makes most potently for good, in its undefined scope, and inordinate exercise lurks no small danger to the Republic, for the difficulty which is experienced in defining its just limits and bounds affords a temptation to the legislature to encroach upon the rights of citizens with experimental laws none the less dangerous because well meant. We think the act under consideration gives plain evidence of such encroachment. It is sought to be upheld by the argument that it is a police regulation; that it seeks to protect labor against the oppression of capital. The people have passed the law; let not the courts interfere with it. If the people are dissatisfied they may amend or repeal it.

It is not easy to see where or how this law protects labor from the unjust exactions of capital. A man's constitutional liberty means more than his personal freedom. It means, with many other rights, his right freely to labor, and to own the fruits of his toil. It is a curious law for the protection of labor which punishes the laborer for working. Yet that is precisely what this law does. The laboring barber, engaged in a most respectable, useful, and cleanly pursuit, is singled out from the thousands of his fellows in other employments and told that, willy nilly, he shall not work upon holidays and Sundays after 12 o'clock noon. His wishes, tastes, or necessities are not consulted. If he labors, he is a criminal. Such protection to labor, carried a little further, would send him from the jail to the poorhouse. How comes it that the legislative eye was so keen to discern the needs of the oppressed barber, and yet was blind to his toiling brethren in other vocations? Steam car and street car operatives toil through long and weary Sunday hours; so do mill and factory hands. There is no Sunday period of rest, and no protection for the overworked employés of our daily papers. Do these not need rest and protection? The bare suggestion of these considerations show the injustice and inequality of this law. In brief, whether or not a general law to promote rest from labor in all business vocations may be upheld as within the due exercise of the police power as imposing for its welfare a needed period of repose upon the whole community, a law such as this certainly can not. A law is not always general because is operates upon all within a class. There must be back of that a substantial reason why it is made to operate only upon a class, and not generally upon all. As was said in Passadena v. Simpson, 91 Cal., 238, 27 Pac., 604: "The conclusion is that, although a law is general and constitutional when it applies equally to all persons embraced in a class founded upon some natural or intrinsic or constitutional distinction, it is not general or constitutional if it confers particular privileges or imposes peculiar disabilities or burdensome conditions in the exercise of a common right upon a class of persons arbitrarily selected from the general body of those whose stand in precisely the same relation to the subject of the law."

And in Darcy v. City of San Jose, 104 Cal., 642, 38 Pac., 500: "The classification, however, must be founded upon differences which are either defined by the constitution or natural, and which will suggest a reason, which might rationally be held to justify the diversity of legislation." In the case of our cities the constitution itself decrees a classification by population, and the differing exigencies of municipal government require that laws operating upon any class should be held general; otherwise the constitutional scheme itself is overthrown. But in a law such as this no reason has been or can be shown why the followers of one useful and unobjectionable employment should be debarred from the right to labor upon certain days, and others, in like classes of employment be not so debarred. If it be constitutional to single out one such class, and debar its members from the right to labor on one day in the week, it would be constitutional to prohibit them from following their vocation upon six days of the week. When any one such class is singled out and put under the criminal ban of a law such as this, the law not only is special, unjust, and unreasonable in its operations, but it works an invasion of individual liberty—the liberty of free labor, which it pretends to protect. Here * * * the designated class is based upon no distinction, and, as is said by Judge Cooley: "Everyone has a right to demand that he be governed by general rules; and a special statute that singled his case out as one to be regulated by a different law from that which is applied in all similar cases would not be legitimate legislation, but an arbitrary mandate, unrecognized by the law." The prisoner is discharged.

SUNDAY LABOR—BARBERS—CONSTITUTIONALITY OF STATUTE—*State v. Granneman, 33 Southwestern Reporter, page 784.*—William Granneman was convicted in the St. Louis court of criminal corrections of plying his trade as a barber on Sunday in violation of the act approved March 18, 1895, and from the judgment of said court he appealed to the supreme court of Missouri.

The act under which the conviction was had reads as follows:

SECTION 1. It shall be a misdemeanor for any person to carry on the business of barbering on Sunday.

SEC. 2. Anyone found guilty of violating the first section of this act shall be fined not less than twenty-five dollars, nor more than fifty dollars, or imprisoned in the county jail not less than fifteen nor more than thirty days, or both, in the discretion of the court.

January 21, 1896, the supreme court rendered its decision in this case, declaring the above act unconstitutional and reversing the judgment of the lower court. From the opinion of said court, delivered by Judge Burgess, the following is quoted:

Defendant's first contention is that the act of the general assembly, under which the conviction was had, is in conflict with section 53, article 4, of the constitution of this state, and therefore void.

The section of the constitution with which it is claimed that the law is in conflict provides that "the general assembly shall not pass any local or special law. * * * And when a general law can be made applicable, no local or special law shall be enacted; and whether a general law could have been made applicable in any case is hereby declared a judicial question, and as such shall be judicially determined, without regard to any legislative assertion on that subject."

Barbering is laboring, and the object of the act is to enforce an observance of the Sabbath, and to prohibit that kind of labor on that day. The policy of our laws is to compel the observance of Sunday as a day of rest, and if this may be done by a general law, applicable alike to all classes and kinds of labor, then the act falls within the inhibition of the paragraph of the constitution quoted, which prohibits the legislature from passing any local or special law, where a general law can be made applicable. That a general law prohibiting all kinds of labor on Sunday may not only be passed, but that we have such a law now upon our statute book, is indisputable. 1 Rev. St. 1889, § 3852. The fact that laboring on Sunday may be prohibited by proper legislation, as a police regulation, does not place the act beyond or without the inhibition of the constitution.

If the act is valid, then why may not the legislature by one act prohibit the farmer from laboring on Sunday, by another a blacksmith, and so on until all kinds of labor on that day are prohibited? Clearly, this may be done by a general law embracing all kinds of labor. The object of the constitution is manifest. It was to prohibit special and local legislation, and to substitute general law in place of it, wherever by a general law the same ends could be accomplished. While we recognize the wholesome rule that the invalidity of an act of the legislature passed in conformity with the mandates of the constitution should appear beyond a reasonable doubt before we assume to pronounce it void, there is still another rule, alike obligatory on us, which requires us to pronounce such a law invalid when it clearly appears to be so by reason of its being in conflict with the constitution. Our conclusion is that the law is invalid, because in conflict with the constitution. The judgment is reversed, and defendant discharged.

SUNDAY LABOR—BARBERS—CONSTITUTIONALITY OF STATUTE—*People v. Havnor, 43 Northeastern Reporter, page 541.*—Henry J. Havnor was convicted of carrying on the business of a barber in the city of New York after 1 o'clock p. m. on Sunday in violation of the provisions of chapter 823 of the acts of 1895. The judgment of the trial court was affirmed by the appellate division of the supreme court of New York, and the defendant appealed to the court of appeals of the state, which rendered its decision April 14, 1896, and affirmed the judgments of the lower courts. The following is quoted from the opinion of said court, which was delivered by Judge Vann:

The main ground upon which the defendant asks us to reverse the judgment against him is that the statute under which he was convicted is in conflict with that provision of the constitution which provides that "No person shall be deprived of life, liberty or property without due process of law." Const., art. 1, § 6. The statute in question, entitled "An act to regulate barbering on Sunday," provides that "any person who carries on or engages in the business of shaving, hair cutting or other work of a barber on the first day of the week shall be deemed guilty of a misdemeanor * * * provided that in the city of New York and the village of Saratoga Springs barber shops * * * may be kept open and the work of a barber performed therein until one o'clock of the afternoon on the first day of the week." Laws 1895, c. 823. The defendant claims that this statute deprives him to a certain extent of his "liberty," by preventing him from carrying on a lawful calling as he wishes, and also of his "property," by preventing the free use of his premises, tools, and labor, and thus rendering them less productive. It is not claimed that his occupation is of a noisy nature, or that he so carried on his business as to disturb the peace, quiet, and good order of the neighborhood, or that the act for which he was convicted, if done on any day of the week other than the first, or at any hour of that day prior to 1 o'clock in the afternoon, would have been a violation of the law. Nor is it claimed that the conviction was authorized by the common law, or that it was based upon any statute except the one above cited, and, indeed, the judgment of the court of special sessions expressly refers to that act, and adjudges the defendant guilty of a misdemeanor because he violated its command.

The phrase "due process of law" is not satisfied by a judgment pronounced, after an opportunity to be heard, by a court of competent jurisdiction, in accordance with the provisions of a statute, unless that statute accords with the provisions of the fundamental law. In a broad sense, whatever prevents a man from following a useful calling is an invasion of his "liberty," and whatever prevents him from freely using his lands or chattels is a deprivation of his "property." Yet, during the history of our state, many laws have been passed which, to some extent, have interfered with the right to liberty and property; but their accord with the constitution has seldom been questioned, and, when questioned, has been generally sustained. The power of taxation, the right to preserve the public health, to protect the public morals, and to provide for the public safety, may interfere somewhat with both liberty and property, yet proper statutes to effect these ends have never been held to invade the guaranties of the constitution. While the confinement of the insane or of those afflicted with contagious diseases infringes upon personal liberty, and the destruction of buildings to prevent the spread of fire, the exercise of the power of eminent domain, and the prevention of cruelty to animals encroach upon the right to property, still the proper exercise of these powers, under the authority of the legislature, although constant and known of all men, gives rise to no question of moment under the constitution. The sanction for these apparent trespasses upon private rights is found in the principle that every man's liberty and property is, to some extent, subject to the general welfare, as each person's interest is presumed to be promoted by that which promotes the interest of all. Dependent upon this principle is the great police power, so universally recognized, but so difficult to define, which guards the health, the welfare, and the safety of the public. While this power may not be employed ostensibly for the common good, but really for an ulterior purpose, when its object and effect are manifestly in the public interest, as was said in the Jacobs case, "it is very broad and comprehensive, and * * * under it the conduct of an individual and the use of property may be regulated so as to interfere, to some extent, with the freedom of the one and the enjoyment of the other." In the exercise of this power the legislature has the right, generally, to determine what laws are needed to preserve the public health and protect the public safety, yet its discretion in this respect is not wholly without limit, for our courts have been steadfast in holding that the statute must have some relation to the general welfare; that the purpose to be reached must be a public purpose, and that "the law must in fact be a police law." Thus it has been held that "an act to improve the public health by prohibiting the manufacture of cigars and preparation of tobacco in any form in tenement houses in certain cases" (Laws 1884, c. 272) was unconstitutional, because it did not tend to promote the public health, and that this was not the end actually aimed at. For the same reason "an act to prevent deception in sales of dairy products" (Laws 1884, c. 202) was declared to conflict with the constitution, as it absolutely prohibited an innocent industry that was not fraudulently conducted, solely for the reason that it competed with another, and might reduce the price of an article of food. In a recent case an act prohibiting the sale of any article of food, upon the inducement that something would be given to the purchaser as a premium or reward (Laws 1887, c. 691), was held to be an unauthorized invasion of the rights of property and an improper exercise of the police power of the state. It was expressly declared in that case that the courts must be able to see, upon a perusal of the enactment, that there is some fair, just, and reasonable connection between it and the common good, and that, unless such relation exists, the statute cannot be upheld as an exercise of the police power. Subject, however, to the limitation that the real object of the statute must appear, upon inspection, to have a reasonable connection with the welfare of the public, the exercise of the police power by the legislature is well established as not in conflict with the constitution. When thus exercised, even if the effect is to interfere to some extent with the use of property or the prosecution of a lawful pursuit, it is not regarded as an appropriation of property or an encroachment upon liberty, because the preservation of order and the promotion of the general welfare, so essential to organized society, of necessity involve some sacrifice of natural rights.

The vital question, therefore, is whether the real purpose of the statute under consideration has a reasonable connection with the public health, welfare, or safety. The object of the act, as gathered from its title and text, was to regulate the prosecution of a particular trade on Sunday, by prohibiting it from being carried on as a business on that day, except in two localities, to which the prohibition applies only after a certain hour. It does not require the observance of the Sabbath as a holy day, or in any sense as a religious institution, as is evident from the fact that the entire day is left open to all secular employments but one, and a part of the day, in certain places, to that. There is nothing in the act to prevent the defendant from carrying on his trade "in any manner or in any place that he pleases. He is simply prohibited from carrying on that trade upon Sunday." The peculiar character of the first day of the week, not simply on account of the obligations of religion, but as a day of rest and recreation, has been recognized for time out of mind both by the legislature and the courts. Statutes passed upon the subject while we were a colony of Great Britain, as well as under the various constitutions in force since our organization as a state, have, so far as appears, been uniformly enforced by the courts. Similar laws in other states, and especially those which require the closing of places of business on Sunday, have generally been sustained.

While questions have been raised as to noiseless and inoffensive occupations that can be carried on by one individual without requiring the services of others, as well as to persons who observe the seventh instead of the first day of the week, still the rule is believed to be general throughout the Union, although not generally enforced, that the ordinary business of life shall be suspended on Sunday, in order that thereby the physical and moral well being of the people may be advanced. The inconvenience to some is not regarded as an argument against the constitutionality of the statute, as that is an incident to all general laws. Sunday statutes have been sustained as constitutional almost without exception; the most notable instance to the contrary (Ex parte Newman, 9 Cal., 502), decided by a divided court in an early day in California, having been subsequently overruled by the courts of that state (Ex parte Andrews, 18 Cal., 685; Ex parte Koser, 60 Cal., 202). The leading case in our own state upon the subject is that of Lindenmuller *v.* People (33 Barb., 548), in which Judge Allen discussed the common law, as well as legislation affecting the Sabbath, with great force and clearness. He held, in substance, that the body of the constitution recognizes Sunday as a day of rest, and an instiution to be respected, by not counting it as a part of the time allowed to the governor for examining bills submitted for his approval; that the Sabbath exists as a day of rest by the common law, without the necessity of legislative action to establish it; and that the legislature has the right to regulate its observance as a civil and political institution. That case was expressly approved in Neuendorff *v.* Duryea (69 N. Y., 557, 561, 563), and was referred to as one "which has never been questioned in a court of higher or equal authority," and "as declaring the law of this State." It was cited with approval in People *v.* Moses (140 N. Y., 214, 215; 35 N. E., 499), where Judge Earl, speaking for a majority of the court, said: "The Christian Sabbath is one of the civil institutions of the state, and that the legislature, for the purpose of promoting the moral and physical well being of the people, and the peace, quiet, and good order of society, has authority to regulate its observance and prevent its desecration by any appropriate legislation, is unquestioned." While works of charity and necessity have usually been excepted from the effect of laws relating to the Sabbath, and sometimes, also, those persons who keep another day of the week, still quiet pursuits have not, even when they can be carried on without the labor of others, because general respect and observance of the day, so far as practicable, have been deemed essential to the interest of the public, including as a part thereof those who prefer not to keep the day, as their health and morals are entitled to protection, even against their will, the same as those of any other class in the community. According to the common judgment of civilized men, public economy requires, for sanitary reasons, a day of general rest from labor, and the day naturally selected is that regarded as sacred by the greatest number of citizens, as this causes the least inconvenience through interference with business. (Lindenmuller *v.* People, supra.)

It is to the interest of the State to have strong, robust, healthy citizens, capable of self support, of bearing arms, and of adding to the resources of the country. Laws to effect this purpose, by protecting the citizen from overwork, and requiring a general day of rest to restore his strength and to preserve his health, have an obvious connection with the public welfare. Independent of any question relating to morals or religion the physical welfare of the citizen is a subject of such primary importance to the State, and has such a direct relation to the general good, as to make laws tending to promote that object proper under the police power, and hence valid under the constitution, which "presupposes its existence, and is to be construed with reference to that fact." (Village of Carthage *v.* Frederick, 122 N. Y., 268, 273; 25 N. E., 480.) The statute under discussion tends to effect this result, because it requires persons, engaged in a kind of business that takes many hours each day, to refrain from carrying it on during one day in seven. This affords an opportunity, recurring at regular intervals, for rest, needed both by the employer and the employed, and the latter, at least, may not have the power to observe a day of rest without the aid of legislation. As Mr. Tiedeman says, in his work on Police Powers: "If the law did not interfere, the feverish, intense desire to acquire wealth, * * * inciting a relentless rivalry, and competition, would ultimately prevent not only the wage earners, but likewise the capitalists and employers themselves, from yielding to the warnings of nature, and obeying the instinct of self-preservation, by resting periodically from labor." (Tied. Lim., 181.) As barbers generally work more hours each day than most men, the legislature may well have concluded that legislation was necessary for the protection of their health. We think that this statute was intended and is adapted to promote the public health, and thereby to serve a public purpose of the utmost importance, by promoting the observance of Sunday as a day of rest. It follows, therefore, that it does not go beyond the limits of legislative power by depriving anyone of liberty or property within the meaning of the constitution.

The learned counsel for the defendant, however, criticises the act in question as class legislation, and claims that it is invalid under the fourteenth amendment to the constitution of the United States, because it denies to barbers who do not reside in New York or Saratoga the equal protection of the laws. That amendment does not relate to territorial arrangements made for different portions of a State, nor to legislation which, in carrying out a public purpose, is limited in its operation, but, within the sphere of its operation, affects alike all persons similarly situated. It was not designed to interfere with the exercise of the police power by the state for the protection of health, or the preservation of morals. The statute treats all barbers alike within the same localities, for none can work on Sunday outside of New York and Saratoga, but all may work in those places until a certain hour. All are, therefore, treated alike under like circumstances and conditions, both in the privileges conferred and in the liabilities imposed. (Hayes *v.* Missouri, 120 U. S., 68; 7 Sup. Ct., 350.) As was said by the learned appellate division in deciding this case: "If the legislature has power to regulate the observance and prevent the desecration of the Sabbath, it has the power to say what acts in the different localities of the state it is necessary to prohibit to accomplish this purpose. It is quite conceivable that an act in one locality, thickly settled, should be prohibited which in sparsely settled districts of the state could be allowed, and for this reason an act might be objectionable in one district, but not in another. All of these regulations have in view the proper observance of the day, and are within the discretion of the legislature."

We think that the statute violates no provision of either the federal or state constitution, and that the judgment appealed from should, therefore, be affirmed.

This case was decided by a divided court, and strong dissenting opinions were delivered by Judges Gray and Bartlett.

DECISIONS UNDER COMMON LAW.

Employers' Liability.—In the case of Burke et al. *v.* Anderson, the United States circuit court of appeals, seventh circuit, on October 7, 1895, affirmed the judgment of the United States circuit court for the western district of Wisconsin, by which $4,000 damages were awarded T. Knut Anderson for personal injuries caused by an explosion of dynamite under the following circumstances: Matthew C. Burke was a contractor, engaged in making a roadbed for a railroad, and his co-defendant, John Burke, had sole charge of the work for him as general manager and superintendent. The work was carried on by blasting the frozen ground with dynamite and other explosives and afterwards breaking it up with picks, John Burke having personal charge of the blasting. Anderson, a common laborer, unfamiliar with the use of explosives, was hired by John Burke and set to work digging with a pick at a spot where the blasting had been done the day before, without warning or knowledge of possible danger. Anderson was injured by an explosion caused by striking with his pick a piece of dynamite remaining from the blast, which was found to have been negligently conducted.

The court held that, as Matthew C. Burke had created the risk due to the presence of explosives for his own purposes, and was bound not only to exercise the utmost care and every available precaution against possible injury to the workmen, but to give them warning of the risk, and as Anderson was ignorant of the risk when he undertook the work of digging, Burke was liable to him for the injury suffered.

The decision delivered by Judge Seaman, as reported in volume 69 of the Federal Reporter, page 814, is based on the following reasoning:

The question in this case upon which the liability of the principal defendant, Matthew C. Burke, depends, is this: What is the rule of care to be applied to an employer of labor who uses explosives or other dangerous means in the prosecution of the work in which the laborer is engaged? The liability of Matthew C. Burke is asserted on the doctrine of respondeat superior, and based upon the alleged negligence of John Burke (1) in so carrying on the blasting, or using the dynamite and powder, that an unexploded portion was left in the ground; and (2) in sending the plaintiff into the place where this danger lurked, without warning of its existence and without sufficient precautions to guard against injury. The counter proposition, on which Matthew C. Burke claims exemption from any liability, is substantially this: That the work of blasting and removing any unexploded charge was "not the personal duty of the master, but only the work of an operative," and consequently any negligence therein of John Burke was in the character of fellow-servant, a risk assumed by the plaintiff, which precludes recovery against the master.

This conflict must be resolved in accordance with the general rule which is clearly pronounced in the recent decision by the supreme court of the United States in the case of Mather *v.* Rillston (156 U. S., 391). In affirming the judgment, the court, speaking unanimously through Mr. Justice Field, states the doctrine applicable here:

"All occupations producing articles or works of necessity, utility, or convenience may undoubtedly be carried on, and competent persons, familiar with the business, and having sufficient skill therein, may properly be employed upon them; but in such cases, where the occupation is attended with danger to life, body, or limb, it is incumbent on the promoters thereof and the employers of others thereon to take all reasonable and needed precautions to secure safety to the persons engaged in their prosecution; and for any negligence in this respect, from which injury follows to the persons engaged, the promoters or the employers may be held responsible and mulcted to the extent of the injury inflicted. The explosive nature of the materials used in this case * * * was well known to the employers, and was a continuing admonition to them to take every precaution to guard against explosions. Occupations, however important, which can not be conducted without necessary danger to life, body, or limb, should not be prosecuted at all without all reasonable precautions against such dangers afforded by science. The necessary danger attending them should operate as a prohibition to their pursuit without such safeguards. * * * If an occupation attended with danger can be prosecuted by proper precautions without fatal results, such precautions must be taken by the promoters of the pursuit or employers of laborers thereon. Liability for injuries following a disregard of such precautions will otherwise be incurred, and this fact should not be lost sight of. So, too, if persons engaged in dangerous occupations are not informed of the accompanying dangers, by the promoters thereof, or by the employers of laborers thereon, and such laborers remain in ignorance of the dangers and suffer in consequence, the employers will also be chargeable for the injuries sustained."

In the case at bar the only explicable cause of injury to the plaintiff was the presence in the ground of some remnant of the explosives which had been employed in blasting. The danger was not inherent in his work; was not one to be anticipated in the labor with pick and spade in a gravel cut for which he was hired; it was not of natural or purely accidental origin, but was produced by the act or requirement of the master in using a dangerous agency to advance his undertaking. Except for the explosive materials carried there for the master's purposes, the plaintiff could have worked safely in the place to which he was assigned. The testimony is undisputed that he had engaged in the work only three days before, had no experience in or knowledge of the use or danger of explosives thus employed, and had no information or suspicion that danger was incurred by digging in this ground. He obeyed the express order of the superintendent to enter and work there, relying, as he had a right to rely, upon the implied assurance of the master that the place was reasonably safe; that there was no other danger there "than such as was obvious and necessary." The master provides the place for his servants to work, and if his acts create special danger, he is not alone chargeable with the positive duty to exercise the utmost care and every available precaution against possible injury to those who are to work there; but if danger impends notwithstanding the precautions taken, he is further obligated to give due information and timely warning to those in his service who are ignorant of its extent before calling upon them to incur the risk.

In respect of the employment of the plaintiff and the directions for his work, it is unquestionable and conceded that the superintendent represented the master as vice-principal. In the same relation he is chargeable with knowledge of the danger in using explosives, and with the duty to protect employés and notify them of risk. If the plaintiff was not informed of the peril which compliance with the order involved, or it was not clearly apparent, the risk thus created can not be held to have been contemplated in the service in which he was engaged, and therefore it was not one assumed by him in his employment. The instructions requested on behalf of the principal defendant, and the theory of the whole defense as well, rest upon the claim that the operation of blasting was common labor, and not the work of a superintendent or vice-principal; that its performance by the superintendent was in the character of a fellow-servant, and the master was not liable for any neglect therein beyond the exercise of ordinary care in selecting his servants. In the same connection it is argued that the use and care of the explosives was not a personal duty of the master.

It is sufficient that the risk was created by the master or for his purposes; that there is legitimate finding by the jury of negligence on the part of those engaged in the performance, causing the injury; and, finally, that the plaintiff was ignorant of the risk, and had not assumed it. The doctrine which exempts the master from liability arising out of the negligence of fellow-servants is based upon the assumption by the servant of the ordinary risks of his employment, in which the negligence of fellow-servants is included, but it has no application to risks which are not contemplated by him in entering upon the service, and certainly can not govern for this extraordinary risk interposed by the master without warning.

BLACKLISTING.—In the United States circuit court, southern district of Florida, on January 21, 1896, in the case of W. E. Willett *v.* Jacksonville, St. Johns and Indian River Railroad Company, a jury awarded Willett the sum of $1,700 as damages against the railroad company for blacklisting him, which amount, together with the costs in the case, the company paid.

From information furnished the Department of Labor by the clerk of the court in which the case was tried, the facts upon which the suit was based appear to have been as follows: Willett, while employed as a conductor by the defendant company, sought employment on another railroad, the Savannah, Florida and Western (formerly the South Florida). He was notified that employment would be given him, and directed to report for duty immediately, and passes were sent him to enable him to go over the road of the Savannah, Florida and Western Railroad Company and learn the route before entering regularly upon the duties of his new position. He at once telegraphed to the proper official of the Jacksonville, St. Johns and Indian River Railroad Company, asking to be relieved from duty at a certain station, but was requested by the company to remain in its employ and take out another train. He finished the run he was then making and made the return run, telegraphing the official that he would leave the employ of the company upon arrival at its terminus, which he did, and proceeded to go over the line of the Savannah, Florida and Western Railroad Company to learn the route.

Before he had finished the preliminary trip he received a telegram from the officers of the last-named company directing him to "come back." He complied with this order, and upon returning was informed that he could not be employed. He subsequently ascertained the reason for this refusal to employ him to have been that the superintendent of the company whose service he had left, had written a letter to the superintendent of the company whose service he was about to enter, cautioning him against Willett, who, the letter stated, had left their employ with certain charges pending against him.

The principal defense of the railroad company was that the letter was a personal one, and not written officially, but this defense was of no avail, and, as before stated, Mr. Willett successfully prosecuted his suit against the company whose superintendent had prevented his employment by another company.

So far as the Department of Labor is advised, this is the first case of the kind ever tried in the United States in which an award of damages has been made and paid for blacklisting.

EMPLOYERS' LIABILITY.—The supreme judicial court of Massachusetts decided on November 29, 1895, in the case of O'Connor *v.* Rich, that a master, having furnished suitable material, is not responsible for injuries to a servant resulting from the negligence of another servant in putting a defective plank into a scaffold, though the scaffold was erected and the defective plank placed therein before the injured servant entered the master's service.

The facts in the case are stated in the opinion of the court which was delivered by Judge Knowlton. Said decision is published in volume 42 of the Northeastern Reporter, page 111, and is as follows:

The plaintiff fell and was injured by reason of the breaking of a plank in a temporary staging on which he was working in the defendant's building. It is not disputed that the staging was of a kind the construction of which is ordinarily left to the servants of the builder, and that the duty of the master concerning it was performed if he furnished a sufficient supply of suitable materials from which to construct it. In this case there was uncontradicted evidence that there were plenty of planks furnished by the defendant from which to build the staging, and the negligence, if there was any, was on the part of the workmen who put the planks in place, in taking one which was not adapted to such a use. Upon these facts, if the plaintiff had been in the defendant's service at the time when the staging was built, it would be very clear that he could not maintain his claim.

But it appears that, although he had previously worked for a considerable time upon the building, he was away working for another person four days before the day of the accident, and this staging was erected a day or two before his last engagement in the defendant's service began. Under these circumstances, the question is whether the defendant is liable to him for the previous negligence of a servant in doing work which may properly be intrusted to servants. We are of opinion that an employer, under such circumstances, owes one who is about to enter his service no duty to inspect all the work which has been done by his servants previously, and which ordinarily may be intrusted to them, without liability to their fellow-servants for their negligence. If he owes no such duty, the risk of accident from previous negligence of servants in their own field is one of the ordinary risks of the business which the employé assumes by virtue of his contract on entering the service.

STRIKES, CONSPIRACY, LABOR COMBINATIONS NOT UNLAWFUL.—In the circuit court of Greene county, Ind., Benjamin F. Watson recovered damages in an action against Thomas Clemitt and others for having been driven from his employment as workman in a coal mine by an alleged wrongful conspiracy among other workmen in the mine, who agreed with each other not to work with him and to quit work unless he was discharged, pursuant to which they did quit work upon their employer's refusing to discharge Watson, by reason whereof the business was suspended and he was thrown out of work.

The defendants appealed to the appellate court of Indiana, which tribunal reversed the decision of the circuit court and held that such a combination among workmen is not actionable in the absence of malice, intimidation, or violence, or evidence that they were bound to continue work, or that the employer was obliged to retain the plaintiff in his service.

The opinion of the appellate court, delivered by Chief Justice Gavin December 10, 1895, is published in full in volume 42 of the Northeastern Reporter, page 367. In the course of the opinion it is said:

While it is true that, under all civilized forms of government, every man surrenders for the general good a certain amount of that absolute freedom of action which may adhere to the individual in an independent or natural state, yet, under our institutions, it is a cardinal principle that each man retains the greatest freedom of action compatible with the general welfare. The right to control his own labor, and to bestow or withhold it where he will, belongs to every man. Even though he be under contract to render services, the courts will not interfere to compel him to specifically perform them. (Arthur *v.* Oakes, 11 C. C. A., 209; 63 Fed., 310.)

So far as appears by these instructions [of the circuit court to the jury] none of the appellants were under any continuing contract to labor for their employer. Each one could have quit without incurring any civil liability to him. What each one could rightfully do certainly all could do if they so desired, especially when their concerted action was taken peaceably, without any threats, violence, or attempts at intimidation. There is no law to compel one man or any body of men to work for or with another who is personally obnoxious to them. If they can not be by law compelled to work, I am wholly unable to see how they can incur any personal liability by simply ceasing to do that which they have not agreed to do, and for the performance of which they are under no obligation whatever.

Under our law every workman assumes many risks arising from the incompetency or negligence of his fellow-workmen. It would be an anomalous doctrine to hold that after his fellows have concluded that he was not a safe or even a desirable companion they must continue to work with him under the penalty of paying damages if by their refusal to do so the works are for a time stopped and he thrown out of employment. We can not believe it to be in accordance with the spirit of our institutions or the law of the land to say that a body of workmen must respond in damages because they, without malice or any evil motive, peaceably and quietly quit work which they are not required to continue rather than remain at work with one who is for any reason unsatisfactory to them. To so hold would be subversive of their natural and legal rights, and tend to place them in a condition of involuntary servitude.

STRIKES, INTIMIDATION, ETC.—RIGHT OF COURT TO INTERFERE BY INJUNCTION.—The supreme court of Missouri, on November 26, 1895, affirmed the judgment of the circuit court of the city of St. Louis in the case of Hamilton-Brown Shoe Company *v.* Saxey et al., and adopted as its own the opinion delivered in said case by Hon. L. B. Valliant, one of the judges of the circuit court, by which A. J. Saxey and others were prevented by injunction from attempting by intimidation, threats of personal violence, and other unlawful means to force the employés of the Hamilton-Brown Shoe Company to quit work and join in a strike.

The opinion in this case is published in volume 32 of the Southwestern Reporter, page 1106, and sufficient portions of it are here reproduced to give a clear understanding of the facts in the case and the reasoning upon which the judgment of the court was based:

The amended petition states in substance that the plaintiff conducts a large shoe manufactory in this city, and has in its employ some eight or nine hundred persons, all of whom are earning their living in plaintiff's employment, and are desirous of so continuing; that the defendants, except two of them, were lately in plaintiff's employ, but have gone out of the same, on a strike, and are now, with the other two defendants, engaged in an attempt to force the other employès of plaintiff to quit their work and join in the strike, and that to accomplish this purpose they are intimidating them with threats of personal violence; that among the plaintiff's employés who are thus threatened are about three hundred women and girls and two or three hundred other young persons; that the effect of all this on the plaintiff's business, if the defendants are allowed to proceed, would be to inflict incalculable damage.

The defendants have appeared by their counsel, and, by their demurrer filed, admit that all the statements of the amended petition are true; but they take the position that, even if they are doing the unlawful acts that they are charged with doing, still this court has no right to interfere with them, because they say that what they are doing is a crime, by the State law of this State, and that for the commission of a crime they can only be tried by a jury in a court having criminal jurisdiction. It will be observed that the defendants do not claim to have the right to do what the injunction forbids them doing. Their learned counsel even quotes the statute to show that it is a crime to do so. But he contends that the Constitution of the United States and the constitution of the State of Missouri guarantee them the right to commit crime, with only this limitation, to wit, that they shall answer for the crime, when committed, in a criminal court, before a jury, and that to restrain them from committing crime is to rob them of their constitutional right of trial by jury. If that position be correct, then there can be no valid statute to prevent crime. But that position is contrary to all reason. The right of trial by jury does not arise until the party is accused of having already committed the crime. If you see a man advancing upon another with murderous demeanor and a deadly weapon, and you arrest him—disarm him—you have perhaps prevented an act which would have brought about a trial by jury, but can you be said to have deprived him of his constitutional right of trial by jury? The train of thought put in motion by the argument of the learned counsel for defendants on this point leads only to this end, to wit, that the Constitution guarantees to every man the right to commit crime, so that he may enjoy the inestimable right of trial by jury.

Passing now to the question relating to the particular jurisdiction of a court of equity, we are brought to face the proposition that a court of equity has no criminal jurisdiction, and will not interfere by injunction to prevent the commission of a crime. These two propositions are firmly established; and as to the first, that a court of equity has no criminal jurisdiction, there is no exception. As to the second, that a court of equity will not interfere by injunction to prevent the commision of a crime, that, too, is perhaps without exception, when properly interpreted, but it is sometimes misinterpreted. When we say that a court of equity will never interfere by injunction to prevent the commission of a crime, we mean that it will not do so simply for the purpose of preventing a violation of a criminal law. But when the act complained of threatens an irreparable injury to the property of an individual a court of equity will interfere to prevent that injury, notwithstanding the act may also be a violation of a criminal law. In such case the court does not interfere to prevent the commission of a crime, although that may incident-ally result, but it exerts its force to protect the individual's property from destruction, and ignores entirely the criminal portion of the act. There can be no doubt of the jurisdiction of a court of equity in such a case.

Equity will not interfere when there is an adequate remedy at law. But what remedy does the law afford that would be adequate to the plaintiff's injury? How would their damages be estimated? How compensated? The defendants' learned counsel cites us to the criminal statute, but how will that remedy the plaintiffs' injury? A criminal prosecution does not propose to remedy a private wrong.

What a humiliating thought it would be if these defendants were really attempting to do what the amended petition charges, and what their demurrer confesses—that is, to destroy the business of these plaintiffs, and to force the eight or nine hundred men, women, boys, and girls, who are earning their livings in the plaintiffs' employ, to quit their work against their will—and yet there is no law in the land tó protect them. The injunction in this case does not hinder the defendants doing anything that they claim they have a right to do. They are free men, and have a right to quit the employ of the plaintiffs whenever they see fit to do so, and no one can prevent them; and whether their act of quitting is wise or unwise, just or unjust, it is nobody's business but their own. And they have a right to use fair persuasion to induce others to join them in their quitting. But when fair persuasion is exhausted they have no right to resort to force or threats of violence. The law will protect their freedom and their rights, but it will not permit them to destroy the freedom and rights of others. The same law which guarantees the defendants in their right to quit the employment of the plaintiffs at their own will and pleasure also guarantees the other employés the right to remain at their will and pleasure. These defendants are their own masters, but they are not the masters of the other employés, and not only are they not the masters of the other employés, but they are not even their guardians. There is a maxim of our law to the effect that one may exercise his own right as he pleases, provided that he does not thereby prevent another exercising his right as he pleases. This maxim or rule of law comes nearer than any other rule in our law to the golden rule of Divine authority: "That which you would have another do unto you, do you even so unto them." Whilst the strict enforcement of the golden rule is beyond the mandate of a human tribunal, yet courts of equity, by injunction, do restrain men who are so disposed from so exercising their own rights as to destroy the rights of others.

INJUNCTIONS AGAINST LABOR ORGANIZATIONS—*Silver State Council, No. 1, of American Order of Steam Engineers v. Rhodes et al., 43 Pacific Reporter, page 451.*—This case was heard in the district court of Arapahoe county, Col., the injunction asked for being refused and judgment rendered for the defendants. The plaintiff brought the case on error to the court of appeals of Colorado, and on November 11, 1895, the decision of said court was given, in which the judgment rendered in the court below was affirmed. The facts in the case are sufficiently set out in the opinion of the court delivered by Judge Thomson, which is as follows:

The purpose for which this proceeding was instituted is set forth in the prayer of the complaint, which we quote: "That an injunction issue out of this honorable court, enjoining, restraining, and prohibiting the above-named defendants, each and all of them, and their said organizations, their servants, agents, and employés, both as individuals and organizations, in any manner interfering with or trying by threats, boycotts, strikes, or intimidations to break up and destroy, or cause the resignation of any member by threats, boycotts, strikes, or intimidations, of Silver State Council, No. 1, American Order of Steam Engineers, plaintiff herein, or by strikes, boycotts, or any other threats to compel it or its members to throw up its certificate, articles, or charter of incorporation or organization, or to in any manner interfere with the rights and privileges of Silver State Council, No. 1, of the American Order of Steam Engineers, plaintiff herein, or its right to exist and enjoy its rights, privileges, and freedom under the laws under which it was created; for costs herein expended, and will ever pray."

The complaint avers the capacity in which the plaintiff sues, and the objects of its corporate existence as follows: "The plaintiff is a corporation organized and existing by and under the laws of the State of Colorado, for the purpose of promoting a thorough knowledge in its members of theoretical and practical steam engineering, to help each other to obtain employment, bury the dead, extend the license law throughout the United States as well as the State of Colorado, and for the further purpose of helping its members according to the terms set forth in its certificate of incorporation, reference to which is hereto made." The complaint further states that the plaintiff is a "nonstriking labor organization;" that certain of the defendants are trustees of an organization called the "Trades and Labor Assembly," which is composed of various labor unions of Denver and vicinity, and was organized for the purpose (among other things) "of enforcing the rights of their several component parts by ordering a strike against all other organizations, employers, or individuals against whom it or they may have a grievance, and can not enforce their rights upon which they base their demands;" that certain other defendants are officers and members of an organization known as "Steam Engineers' Protective Union, No. 5703, of the American Federation of Labor," whose objects are to compel all stationary steam engineers to join their order, "and to resort to force by boycotting anyone who employs stationary steam engineers not members of said organization," or not subject to its orders or those of the Federation of Labor; and that the members of this organization are also members of the Trades and Labor Assembly.

It is also alleged that in March, 1892, the plaintiff was admitted into, and became a member of, the Trades and Labor Assembly, and in April, 1893, was expelled from that body, because its charter, constitution, and by-laws declared that it was a "nonstriking" organization, and that its expulsion was in pursuance of a conspiracy among certain of the defendants, members of the assembly, who, together with the other defendants, have since its expulsion been constantly endeavoring "in all manner and ways, both openly and in secret, to destroy and exterminate" it. This purpose was proposed to be accomplished "by declaring boycotts and strikes and using other means of warfare known to striking organizations against any and all who would employ any stationary steam engineer who was a member or belonged to Silver State Council, No. 1, of the American Order of Steam Engineers." Some instances are given in which it was attempted to compel engineers belonging to the plaintiff's organization to join the union, or procure their discharge from employment, by threatening to "boycott" and "levy strikes against" their employers. The plaintiff is a corporation, and to entitle it to relief, it must appear that its corporate rights are threatened with some injury of a kind which may be made the subject of an action, and for which courts have the power to afford redress. The complaint is that the defendants have banded together and conspired to "exterminate" the plaintiff; and that they propose to accomplish their purpose by compelling its members to leave it. Of course, when its members have all withdrawn, it will be extinct. We need not discuss the character of the means to be employed for its disintegration. Whether they are legal or illegal, they can not be made the subject of an action in favor of the plaintiff. It has no property in its members, and, in losing them, it sustains no damage which the law recognizes as damage. It can not compel its members to remain with it; and, if they are violently driven out of it,—if they are forced to relinquish their membership against their will,—the grievance is theirs, and not the plaintiff's. Or if, for the purpose of forcing their withdrawal, others, by means of "boycotts" or "strikes," are made to suffer, the latter must fight their own battles. The law does not make the plaintiff their champion. The disorganization and resulting extinction of the plaintiff would, doubtless, be a calamity; but it is one which the law is powerless to avert. We have cited no authorities because we can find none which are of any use. If a case bearing the remotest analogy to this was ever the subject of adjudication, our most diligent effort has failed to unearth any record of it. The judgment will be affirmed.

CONSPIRACY—BOYCOTTS—*Oxley Stave Co. v. Coopers' International Union of North America et al., 72 Federal Reporter, page 695.*—This case was brought in the United States circuit court for the district of Kansas by a bill in equity filed by the Oxley Stave Company against the Coopers' International Union of North America, Lodge No. 18, of Kansas City, Kans., the Trades Assembly of Kansas City, Kans., and various individuals named, who are officers and members of such organizations, and also against "all other persons who may be members of either of said organizations, their agents, attorneys, etc.," to enjoin them from inaugurating and maintaining a boycott against the use of packages, casks, barrels, etc., made by complainant by means of certain machines constituting part of its plant. The circuit court rendered its decision March 9, 1896, and allowed the injunction asked for. The opinion of said court was delivered by District Judge Foster, and the following is quoted therefrom:

This brings us to the question whether, under the allegations of the bill, which is verified, and the other evidence presented, the complainant is entitled to the relief prayed for. The material allegations of the bill are but partially controverted by the defendants. Indeed, they are substantially admitted. Much testimony was offered to show that barrels hooped by machinery were not as serviceable or as valuable as hand-hooped barrels. It also appears that there is some little difference in the price of such barrels; that a skilled workman can hoop 14 to 16 barrels per day by hand, and that the hooping machine does the work of about six or seven men; and that boys or young men, from 16 years upward, are employed, to some extent, in operating the machines. All of this cuts but little figure in the case. Whether the work of the machine is better or worse than the hand work is not material. The barrels are made and sold as machine work, and a price fixed accordingly, and the customer must decide whether or not he will buy them; and the complainant, in operating the machines in its business, is engaged in a legitimate enterprise, and defendants had no legal right to demand that it should cease operating them. There is some testimony tending to show that the reason the packing companies had not made contracts for these barrels for this year was not on account of the threatened boycott, but because they preferred hand-hooped barrels. The purchasing agent of Fowler Sons & Co., Limited (Robert McWhittaker), however, testified that a committee of the Coopers' Union and Trades Assembly notified him, if his company purchased machine-made barrels, they would boycott the contents of the barrels, and that such notice would tend to make his company very careful about purchasing machine-made barrels. The manager of Swift & Co. testified that his company was buying hand-made barrels on account of the threatened boycott. The following is a copy of the resolution of the Trades Assembly on the subject, and indicates the purpose of the defendant associations:

"To the officers and members of the Trades Assembly, greeting: Whereas, the cooperage firms of J. R. Kelley and the Oxley Cooperage Company have placed in their plants hooping machines operated by child labor; and whereas, said hooping machines is the direct cause of at least one hundred coopers being out of employment, of which a great many are unable to do anything else, on account of age,—at a meeting held by Coopers' Union, No. 18, on the 31st of December, 1895, a committee was appointed to notify the above firms that unless they discontinued the use of said machines on and after the 15th of January, 1896, that Coopers' Union, No. 18, would cause a boycott to be placed on all packages hooped by said machines, the 15th of January, 1896; and at a meeting held by Coopers' Union, No. 18, on the 14th of January, 1896, delegates were authorized to bring the matter before the Trades Assembly in proper form, and petition the Assembly to indorse our action, and to place the matter in the hands of their grievance committee, to act in conjunction with a committee appointed by Coopers' Union, No. 18, to notify the packers before letting their contracts for their cooperage. Therefore, be it resolved, that this Trades Assembly indorse the action of Coopers' Union, No. 18, and the matter be left in the hands of the grievance committee for immediate action.

"Yours respectfully,
"J. L. COLLINS,
"Secretary Coopers' International Union of N. A., Lodge No. 18."

James Cable, president of Coopers' Union, testified as follows:

Unless complainant ceased using the machines—

"That the boycott would be declared by the Coopers' Union upon the contents of the tierces and barrels hooped by machinery; meaning thereby that the members of the said Coopers' Union, and of its parent association, the Trades Assembly, would thereafter cease to purchase or use any of the commodities that were packed in machine-hooped tierces or barrels."

No one can question the right of the defendants to refuse to purchase machine-made packages, or of goods packed in them, or, by fair means, to persuade others from purchasing or using them. If that is all that is implied by a boycott, as insisted by defendants, it is difficult to see where they violate any law, although it might injure the complainant's business. It has been decided, however, that while such action would not be unlawful by an individual, a combination and conspiracy to accomplish the purpose would be an illegal act. In Arthur *v.* Oakes, 11 C. C. A., 209, 63 Fed., 321, 322, Mr. Justice Harlan says:

"It is one thing for a single individual, or for several individuals, each acting upon his own responsibility, and not in coöperation with others, to form the purpose of inflicting actual injury upon the property or rights of others. It is quite a different thing, in the eye of the law, for many persons to combine or conspire together with the intent not simply of asserting their right of accomplishing lawful ends by peaceable methods, but of employing their united energies to injure others or the public. An intent upon the part of a single person to injure the rights of others or of the public is not in itself a wrong of which the law will take cognizance, unless some injurious act be done in execution of the unlawful intent. But a combination of two or more persons with such intent, and under circumstances that give them, when so combined, a power to do an injury they would not possess as individuals acting singly, has always been recognized as in itself wrongful and illegal."

The term "boycott" has acquired a significance in our vocabulary, and in the literature of the law. The resolution of the defendant associations says, unless complainant discontinue the use of said machines on and after January 15, 1896, that Coopers' Union, No. 18, would cause a boycott to be placed on all packages hooped by said machines. Just what action would be taken, the resolution does not state. It does not say the defendants would not purchase the packages, or the goods packed in them, but simply says a "boycott" would issue. That term implies that a general proscription of all articles so manufactured, and the goods packed in them, would be inaugurated and maintained by the power of these assemblies, wherever they could reach. It is fair to presume, from the resolution and other testimony, that the defendants were determined to use all means, short of violence, to make the proscription effective. That has been the history of such proceedings in the past, and such is the meaning imputed to the use of the word "boycott." It has become a word carrying with it a threat and a menace, and was evidently so intended in this resolution. In Thomas *v.* Railway Co., 62 Fed., 818-821, the court says:

"But the combination was unlawful, without respect to the contract feature. It was a boycott."

Again the court says:

"The combination under discussion was a boycott. It was so termed by Debs, Phelan, and all engaged in it. Boycotts, although unaccompanied by violence, have been pronounced unlawful in every State of the United States where the question has arisen, unless it be in Minnesota, and they are held to be unlawful in England."

The court further says:

"Boycotts have been declared illegal conspiracies in State *v.* Glidden, 55 Conn., 46, 8 Atl., 890; in State *v.* Stewart, 59 Vt., 273, 9 Atl., 559; Steamship Co. *v.* McKenna, 30 Fed., 48; Casey *v.* Typographical Union, 45 Fed., 135; Toledo A. A. & N. M. Ry. Co. *v.* Pennsylvania Co., 54 Fed., 730, and in other cases."

From these authorities we reach the conclusion that complainant is entitled to the relief prayed for. The labor-saving machines which modern invention has brought into every industry in life excite our wonder and admiration, but our enthusiasm is subdued by the thought that the machines must largely drive the skilled laborer out of a field he has spent years to fit himself for, and upon which, more or less, depends the means of livelihood for himself and his family; and yet it is a hopeless task for the laborer to contend against the use of machinery, wherever it can be utilized. Labor can only adjust itself to the constant progress made in all the mechanical pursuits, and it has been well said that, despite all the inventions to save hand work, there never was a time when the laborer was paid better, or had greater advantages, than he has to-day. The injunction will be allowed as prayed for by complainant.

CONSPIRACY—UNLAWFUL COMBINATIONS—*Elder et al. v. Whitesides et al. 72 Federal Reporter, page 724.*—This case was brought by a bill in equity filed in the United States circuit court for the eastern district of Louisiana by Elder, Dempster & Co., of Liverpool, England, owners of certain steamboats, against William Whitesides and others, citizens of Louisiana. The bill alleged the existence of an unlawful combination and conspiracy, on the part of the defendants, to prevent the loading or unloading of complainants' steamboats at Gretna, La., except by such labor as might be acceptable to said defendants; that such combination and conspiracy absolutely prevented complainants from loading or unloading their steamers at said port of Gretna by other than the said defendants and their confederates. An injunction was asked restraining the defendants from continuing their said combination and conspiracy. The court rendered its decision March 22, 1895, and granted the injunction asked for.

The opinion of the court was delivered by District Judge Parlange, and the following is quoted therefrom:

The defendants have been granted all the time which they have requested to present their side of of the case. The argument made by their counsel may be divided under four heads. He urged: First, that there is no allegation or proof of any overt act committed by the defendants against the particular vessel mentioned in the bill; second, that a court of equity can not enjoin crime; third, that no damages have actually been inflicted upon the vessel; and, fourth, that the proof of conspiracy is insufficient.

In a recent case decided by the United States circuit court of appeals, seventh circuit (Arthur *v.* Oakes, 11 C. C. A., 209; 63 Fed., 310), in which Mr. Justice Harlan was the organ of the court, all the law points made by the counsel for the defendants have been passed upon, clearly and distinctly. In speaking of combinations and conspiracies, Mr. Justice Harlan said:

"According to the principles of the common law, a conspiracy upon the part of two or more persons, with the intent by their combined power to wrong others, or to prejudice the rights of the public, is in itself illegal, although nothing be actually done in the execution of such conspiracy. This is fundamental in our jurisprudence. So, a combination or conspiracy to procure an employé or body of employés to quit service, in violation of the contract of service, would be unlawful, and, in a proper case, might be enjoined, if the injury threatened would be irremediable in law. It is one thing for a single individual or for several individuals, each acting upon his own responsibility, and not in coöperation with others, to form the purpose of inflicting actual injury upon the property or rights of others. It is quite a different thing, in the eye of the law, for many persons to combine or conspire together with the intent, not simply of asserting their rights or of accomplishing lawful ends by peaceable methods, but of employing their united energies to injure others or the public. An intent upon the part of a single person to injure the rights of others or of the public is not in itself a wrong of which the law will take cognizance, unless some injurious act be done in execution of the unlawful intent. But a combination of two or more persons with such an intent, and under circumstances that give them, when so combined, a power to do an injury they would not possess as individuals acting singly, has always been recognized as in itself wrongful and illegal."

The justice cites approvingly the language of another court, as follows:

"There is nothing in the objection that to punish a conspiracy where the end is not accomplished would be to punish a mere unexecuted intention. It is not the bare intention that the law punishes, but the act of conspiring, which is made a substantive offense by the nature of the object to be affected." State *v.* Buchanan, 5 Har. and J., 317.

The justice further said:

"The authorities all agree that a court of equity should not hesitate to use this power [injunction] when the circumstances of the particular case in hand require it to be done in order to protect rights of property against irreparable damages by wrongdoers. * * * That some of the acts enjoined would have been criminal, subjecting the wrongdoers to actions for damages or to criminal prosecution, does not, therefore, in itself determine the question as to interference by injunction. If the acts stopped at crime, or involved merely crime, or if the injury threatened could, if done, be adequately compensated in damages, equity would not interfere. But as the acts threatened involve irreparable injury to and destruction of property for all the purposes for which the property was adapted, as well as continuous acts of trespass, to say nothing of the rights of the public, the remedy at law would have been inadequate. 'Formerly,' Mr. Justice Story says, 'courts of equity were extremely reluctant to interfere at all, even in regard to cases of repeated trespasses. But now there is not the slightest hesitation, if the acts done or threatened to be done to the property would be ruinous, irreparable, or would impair the just enjoyment of the property in future. If, indeed, courts of equity did not interfere in cases of this sort, there would, as has been truly said, be a great failure of justice in this country.' "

So far as the question of jurisdiction is concerned, it is clearly settled, both by Arthur *v.* Oakes, supra, and by the decision of the United States circuit court of appeals of this (the fifth) circuit. Hagan *v.* Blindell, 6 C. C. A., 86; 56 Fed., 696. In both of those cases the jurisdiction depended entirely, as in the case at bar, upon the diverse citizenship of the parties and the equitable powers of the court.

The decisions above referred to clearly dispose of all the law points raised by defendants' counsel. The proof of conspiracy is made out by the affidavits offered by complainants. The only proof offered by the defendants is their affidavit, which confines itself to a denial that they interfered with the complainants or prevented the loading of the vessel *Niagara,* or caused damages to the complainants. This seems to be in line with the argument of their counsel, and to be based upon the theory that the jurisdiction of the court depends upon unlawful overt acts having been committed against the particular vessel mentioned in the bill, and upon actual damages having been caused the complainants, prior to the application for the injunction. There is no denial of the agreement or conspiracy to do the unlawful things charged in the bill, which conspiracy is the gravamen of the case. The preliminary injunction must issue.

FOURTH ANNUAL REPORT

OF

INSPECTION OF FACTORIES

IN

MICHIGAN

MADE UNDER DIRECTION OF THE

BUREAU OF LABOR AND INDUSTRIAL STATISTICS

BY AUTHORITY

LANSING
ROBERT SMITH PRINTING CO., STATE PRINTERS AND BINDERS
1897

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Commissioner of Labor, - - - Chief Factory Inspector

H. R. DEWEY,

Deputy Commissioner of Labor, - Assistant Chief Factory Inspector

L. S. RUSSELL,	Chief Clerk
FLORENCE ORBISON,	Stenographer

DEPUTY FACTORY INSPECTORS

W. F. TRIPP,	First District
GEO. E. GUNN,	Second District
L. C. F. HINTZ,	Third District
O. O. KRAPF,	Fourth District
T. A. ELY,	Fifth District

LETTER OF TRANSMITTAL.

STATE OF MICHIGAN,
BUREAU OF LABOR AND INDUSTRIAL STATISTICS,
Lansing, Mich., February 1, 1897.

HON. HAZEN S. PINGREE,
Governor of Michigan:

SIR—Act No. 126, session laws of 1893, as amended by act No. 184, session laws of 1895, directs the Commissioner of Labor to cause an annual inspection of all manufacturing places in the State of Michigan and to make an annual report thereof to the Governor.

In accordance with the provisions of said act, I have the honor to transmit herewith the fourth annual report of such inspection made under the direction of this bureau.

Very respectfully,
CHAS. H. MORSE,
Commissioner of Labor.

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INTRODUCTION.

PREFATORY REMARKS.

During the year 1896 there have been 2,991 manufacturing places inspected in Michigan. This is a decrease of 146 from the number inspected in 1895. This is accounted for by the necessity of bringing the year's work to a close earlier to allow this report to be prepared and issued during the term of the present Chief Inspector.

CHILD LABOR.

Inspectors have given special attention to the enforcement of that portion of the law relating to child labor. As a result, there are today very few children employed in manufacturing establishments in violation of the law. It must be remembered that while the employment of children under fourteen years of age is absolutely prohibited, a certificate from parents or guardian admits any child over fourteen into any factory where they can find employment. Undoubtedly a very few children are employed after furnishing false certificates as to age. The law should be amended to compel parents to furnish sworn certificates of age.

Apparently many people suppose the factory inspection law reaches all places where children are employed. Many more children are employed in other places than in factories. The truancy law properly enforced would do very much toward preventing child labor at the expense of adults. The Third Annual Report of Factory Inspection in Michigan uses this language: "A rigid enforcement of both laws would effectually prevent the employment of children under sixteen years of age in factories." It would doubtless prevent their employment in many other places.

OTHER PROVISIONS OF THE LAW.

The provisions of the law relative to fire escapes, elevator protection, blowers and protection to machinery generally, are fairly adequate, though some slight amendments are desirable.

ACCIDENTS.

The number of accidents reported as ascertained by inspectors in 1896, is 164, of which 14 were fatal. This is less than two-thirds of the number reported in 1895. This certainly shows the practical benefit of Factory Inspection.

BOILER INSPECTION.

In the last few years many people have agitated the question of "Boiler Inspection," insisting that a thorough system of boiler inspection was necessary to insure the safety of persons employed near steam boilers. It has been claimed that many explosions were due to neglect, caused by the engineers voluntarily absenting themselves from the vicinity of their engines, or being called upon to perform other duties which necessarily took them away from their engines. Quite often the engineer is an expert in caring for machinery, and because of this is a "man of all work" in a factory.

Deputy factory inspectors were directed to make inquiries relative to steam boilers, engineers, firemen and their duties. The result of their inquiries in the 2,991 factories inspected is as follows:

FACTORIES AND POWER.

Number factories using steam power	1,503
Number factories using water and steam power	46
Number factories using other kinds of power	599
Number factories using no power	430
Number factories idle, kind of power not given	413
Whole number factories inspected	2,991

BOILERS.

Number of boilers in use in factories inspected	2,946
Aggregate horse power of boilers in use	212,751
Average horse power for each factory	71¾.

ENGINEERS AND FIREMEN.

Number of engineers employed	1,662
Number factories having no engineers	8
Number factories requiring other work of engineers	1,036
Number factories not requiring other work of engineers	504
Number of factories having inexperienced persons care for engines and boilers	27
Number firemen employed	797
Number factories employing no firemen	1,087

Apparently there is an increased demand for a law providing for a rigid inspection of steam boilers. People will differ as to this inspection. Some will favor it being done by the State, while others will deem an inspection under municipal authority better. State inspection could reach every boiler in the State. Municipal inspection might answer in cities and large villages. It is unnecessary to go into details here as to what the inspection should cover, or how often it should be made. It might be made a separate bureau, or it might be made a part of Factory Inspection. In either case only well known experts should be employed as inspectors. A moderate fee to be paid by owners would meet the expense of inspection and publication of reports. In connection with this there should be an examination of engineers. Too many men who are incompetent and irresponsible are entrusted with the duties of engineers. As has been said before, too often the engineer has many duties calling him away from the engine room. Under such circumstances an engineer can hardly be held responsible if accidents occur. The appalling loss of life and immense destruction of property absolutely demand that all possible safeguards be provided for those employed around steam boilers. Undoubtedly the legislature should provide for a thorough system of boiler inspection in Michigan.

BAKE SHOPS.

There is no adequate provision for the inspection of bake shops in Michigan, and while there are many fine establishments of this kind in the State, there are also others so conducted that no one ought to eat their product. Several States have special laws for bake shop inspection, and it is hoped the legislature at its present session will provide such a law for Michigan..

PUBLIC BUILDINGS.

There are in Michigan hundreds of public buildings, including hotels, public halls, and mercantile establishments, that are veritable fire traps. Many hotels are without external fire escapes of any kind. Stairways and elevators in case of fire are simply flues for passage of smoke and flame. It would be little less than a miracle if guests in hotels of this kind should all escape in case of fire.

Public halls in many cases are reached by narrow stairways and corridors. In case of an alarm of fire a stampede could hardly be averted, in which the loss of life would be fearful. Many mercantile houses employ people on upper floors. Very often goods of an inflammable nature are stored there for repacking of for future use. In case of accident creating a fire the horrors of the Edson, Moore & Co. fire would be repeated. If human lives are valued, the safety of people in all public buildings should be cared for. The laws of the State should provide for an inspection of these places.

FINANCES.

The appropriation of $8,000 for the support of Factory Inspection by close economy will barely enable the employment of five deputy inspectors. Only a limited number of factories can be visited more than once in each year. Experience has shown that where inspectors are able to revisit factories occasionally, orders are more promptly complied with and generally factories are in better condition than where only a yearly inspection can be made. At least ten inspectors could be profitably employed.

REMARKS.

At the International Convention of Factory Inspectors held at Toronto the first week in September, 1896, the Chief Inspector for Michigan reported improvements secured in Michigan as follows:

Fire escapes	200
Elevators protected	350
Blowers or dust arresters	80
Guards or safety devices on different machines	550
Children under 14 discharged	397
Miscellaneous orders complied with	1,560

The law had then been in force three years. There were at that time a large number of orders given, which, under the system observed to report compliance only after a personal investigation, could not be reported as complied with, as many factories had not then been visited. It is known, however, that several hundred orders have been complied with in the four months since the report was made.

In prosecuting the work the rights of employers and employés have been alike respected. Very little ill-feeling has been engendered and the usefulness of the law is generally recognized. Public sentiment sustains the law and in the near future will demand that the inspection be extended to public buildings, hotels, etc. The supreme court has sustained the principle of the law in the only case it has passed upon.

APPRECIATIVE.

Too much credit cannot be extended to deputy factory inspectors who have conducted the inspection. To the industry, energy, and intelligence they have displayed, is ascribed very much of the gratifying results of factory inspection in Michigan. The Chief Inspector very cheerfully acknowledges the valuable assistance they have rendered him.

The Chief Factory Inspector fully appreciates the loyal support he has received from his office force.

Hon. H. R. Dewey, assistant chief inspector, has rendered valuable assistance both in the field and in the office.

Mr. L. S. Russell, chief clerk, has been held responsible for the office work in all its details. Industrious, courteous, and faithful, he has brought to the discharge of his duties an intelligent comprehension of the work which has made his services extremely valuable.

Miss Florence Orbison, stenographer, by the unusual aptitude with which she has familiarized herself with the details of office work, has merited hearty commendation from every person doing business with the office.

FIRST DISTRICT.

W. F. TRIPP, *Deputy Inspector.*

SUMMARY OF WORK IN THE FIRST INSPECTION DISTRICT.

Office of Deputy Inspector,
Detroit, Mich., Nov. 28, 1896.

Hon. C. H. Morse, *Commissioner of Labor, Lansing, Mich.:*

Dear Sir—In accordance with your instructions of November 24th, I submit the following report of factories inspected during the present year, also during the three previous years, and number of changes ordered and number complied with up to the present time, as far as I have been able to revisit this year's work and ascertain. However there is no doubt but what I shall find a large number that have made necessary changes when I come to revisit my district, which I shall do as soon as other matters pertaining to this year's work have been disposed of. Some portions of my district I have not been able to visit since the inspection for this year was made. Other portions have been visited frequently. The reason for this is owing to the nature of the orders and condition of the factories where such changes were recommended. I have made 430 visits during the year of which I have kept a record. A good many of this number were where I had been requested to call and consult with the manager or superintendent in regard to changes required and I want to say here, this is becoming very general in this district. When the time comes to make required improvements the inspector is called in to consult as to best methods, etc.

Kind of changes ordered.	1893.		1894.		1895.		1896.	
	No. of changes ordered.	No. complied.	No. of changes ordered.	No. complied.	No. of changes ordered.	No. complied.	No. of changes ordered.	No. complied.
Fire escapes	55	50	15	14	23	14	9	6
Automatic gates and other elevator protection	14	11	15	10	62	30	179	130
Guards for hatchways	4	4	9	4	31	27	7	4
" " machinery	28	26	45	34	172	86	28	20
New water closets	2	2	4	4	14	10	7	7
Closets repaired	3	3	2	2	5	5	6	6
Hand rails and other stair protection	135	103	126	77	129	55	39	16
Doors changed	18	18	9	8	1	1	1	....
Ladders to roof	6	6	3	1	5	3	2	2
Repairs on buildings	8	8	2	2	5	3	9	5
Blowers ordered and repaired	2	1	8	5	6	1	8	6
Obstructions removed from fire escape windows	13	3	2	2	2	2	2	2
Children under fourteen ordered discharged	22	22	90	90	78	78	15	15
No. places where children have been ordered registered	12	12	38	38	87	87	48	48
Whole number of orders and compliances	322	269	368	291	620	402	360	267

Whole number of factories inspected in 1893	636	......
" " " " revisited " "	......	234
" " " " inspected " 1894	1,019	......
" " " " revisited " "	......	258
" " " " inspected " 1895	1,050	......
" " " " revisited " "	......	272
" " " " inspected " 1896	900	......
" " " " revisited " "	......	480
Whole number of factories inspected since Sept 1, 1893	3,605	......
" " " " revisited " " "	......	1,244

A GENERAL REVIEW OF THE YEAR'S WORK.

At the beginning of this year, my district being cut down to the city of Detroit, instead of Wayne county, I determined to make a thorough canvass of this city, and know every place, both large and small, in my district; but in this I have been somewhat disappointed, there being so many small places, it consumed more time than I anticipated; however owing to the system I adopted, I feel sure I found all the small tailor shops, cigar factories, broom factories and various other small work shops, located in alleys, in rear of houses, up stairs, in barns and in fact most anywhere, except where one would naturally look for work shops. These places usually have from two to eight persons employed, and the rooms generally were in a fair condition, though some were very small and sometimes not well ventilated, however I did not find much violation of the law—a few cases of child labor. This was the main object searching out and investigating these small shops. I felt well paid for the time it took, as I feel now I know more about shop work and its conditions; but I am disappointed that I have not been able to make the second call, except at a few places, besides those who were violating the law in some way. At the latter places I found on my second call my orders all complied with, in most every case.

I felt at the beginning of the year, I could spend this time this year as perhaps the large factories would not take so much of my time, but I find at the close of this year's work, not as many factories reported, but fully as many inspected, including all the small ones I visited, of which there were over 150, including all the small bake shops I did not consider necessary to make a report of. After this was done I find at the close of this year's inspection 356 orders given against 402 last year. I had anticipated each year the work would decrease, but I find the same territory will increase from year to year as new factories come into existence, others are undergoing changes and moving, and at the same time, the manufacturers are becoming more familiar with the law and realize more its aims and objects; therefore more calls for the inspector and more time is consumed.

I feel well satisfied at the close of this year's work, my present district has been well canvassed, but not all of it reached. However, the factories not reached this year or most of them I know need very little attention.

The matter of bake shops, I have made a very thorough investigation of in this city, as you instructed me to do at the beginning of this year and find a majority of them in good condition, but I found a few that were in a filthy state, of which I have made a report. There is great need of a bake shop law, especially in this city, where there are 174 shops, large and small. There is no question about the large bakeries. They are all in fine condition. But there is no doubt if one-half of our citizens who eat baker's goods could see all parts of some of the bake shops in this city they would not buy any more bake shop goods.

Some time has been taken during the year in prosecutions which seemed necessary. Two cases for child labor, that of the Seigel case and one against W. F. Litchenburg & Son; while the former was dismissed on technicalities, it has proven beneficial, not only to us, but for the children they had been in the habit of employing. The latter case was so clear it required but a short time to convince the judge of the guilt of the foreman who was fined $10, and dismissed the members of the firm, as it was clearly proven the foreman was the responsible party in the case.

I have also prosecuted two cases, for failing to provide proper automatic protection for elevators, as required in Section 5; that of Detroit Chicory Company and H. C. Hart Manufacturing Company. Both were decided in our favor, and the judge ordered said protection to be put up within one week, otherwise sentence would follow. It is needless to say proper automatic gates were furnished and put into operation at once.

ELEVATORS.

The elevator is almost indispensable in general manufacturing, where it is necessary to convey material from one floor to another. Then when the goods are finished the elevator usually has to be called into use in order to deliver them into the hands of the shipping clerk before they find their way on the road to the purchaser. Therefore by constant use of the elevator, unless they are operated by careful men, there are always chances for accidents to happen. Still I consider a good elevator, equipped with all the latest improvements and managed by a good careful man, as harmless a piece of machinery as there is around the factory. But the records show there are more accidents occur from the use of the elevators than from any other one thing: However, upon investigation, I usually find the cause is carelessness on the part of the person injured.

In order to show how careless the elevator is used by some employès, I might relate one or two cases that happened in my district this year that I am familiar with. One is the case of a young man sent to the third floor of the factory for some material. It was necessary for him to use a small truck to carry the material. After he had loaded the truck he started with it going backward towards the elevator opening, expecting the elevator was where he left it, but instead, the elevator had been sent down the shaft by another employé who wanted to use it in the basement, therefore, when the young man at the third floor reached the opening, not looking to see whether the elevator was where he left it, he backed into the opening and fell to the basement floor. He was not killed but I am told will never be well.

Another is a case where two men got up to the third floor with some goods on the elevator. While disposing of them the elevator was pulled down by some one below and not knowing this, one of the men stepped backward into the opening and fell to the first floor. He was dead when help came. The heirs of this unfortunate man have since commenced suit against the Company for $20,000 damages.

Now this not only shows how carelessly people work around elevators, but shows how little sometimes saves life and limbs. In both of the above cases, had there been automatic protection of any kind, as provided by the factory inspection law, these accidents would have been avoided, as in each case, when the elevator left the floor, the gates would have closed and prevented either of them getting where there was danger. Therefore I see the importance more each year for the elevator being equipped with all modern devices, especially the automatic gates.

I could relate a large number of cases that I know of where accidents have happened where only a hand device was furnished. A good many of them occurred this year. I have paid particular attention to this matter and have a record of most of them. I have spent more time looking after the guarding of elevator openings, and experienced more trouble and annoyance from this matter than from any other one thing.

I have now about 850 elevators in this district to look after. At the time the factory law went into force, there were very few who had automatic protection furnished for their elevators, and it was hard to get manufacturers at first to see the necessity of it, while others objected to it on account of having tried some cheap device, which soon got out of order, disabling the elevator, which was then condemned.

This is the case especially where the Automatic Hatch Door has been tried in fast running elevators. It is almost impossible to use an Automatic Hatch Door under such circumstances, as they are soon torn off, on account of the speed—so have to apply full automatic gates in many places.

Of all the devices used in this district for this purpose, the Michigan Safety Gate and the Richmond Safety Gate stand the test, and in every instance, so far, have proven practical and satisfactory.

There is a new device just coming into use which I have examined in several buildings, where they are in operation, which I think will work well in a fair speed elevator. This is known as the Anderson Automatic Safety Floor, which prevents fire from spreading as well as protecting the openings from accidents.

As I stated, it was hard at first to get the managers to feel that they ought to go to the expense of any more experimenting, but, after a few of the above named devices were shown them, and they saw them in operation they decided they could not do without them. One large manufacturer here stated, after he had equipped two elevators and had given them a good test with one of the above named gates, that they would pay for themselves in eighteen months in his factory, allowing the time it took to open and close the old gates by hand.

Last year I ordered automatic protection on 62 elevators. At the time I made my report 30 had complied. This year I have followed almost to the letter your instructions of one year ago—that was to serve notice upon every one who had not already provided their elevators with this protection. The result has been, as you will see; I have ordered 180 elevators equipped during the year, and, am happy to state, that up to the present time, 87 have complied. And I have not heard any one say after the work had been completed but what they were glad they had done so, and in many cases, I have heard managers and superintendents say it was a relief to them to know their elevators were now in such shape they did not have to worry about them.

Now, it may seem, that there are a great many yet who have not complied, but there is no doubt before the end of the year that the number will be greatly decreased. In my report I only count on what I know has been finished and those now under contract, which will soon be done. Thus it will be seen that the manufacturers are usually ready to adapt any means that will prevent accidents.

As far as the matter of complying with the law in regard to making repairs on elevators is concerned, I find very little trouble. Such matters are usually taken care of at once, and in only two cases this year have I found where they refused to make such improvements upon their elevators as I deemed necessary. These were the cases already reported to you of the Detroit Chicory Co., and H. C. Hart Manufacturing Co.

BLOWERS AND VENTILATION.

There has been much done in my district in the matter of taking care of the dust that causes so much annoyances in nearly every factory where machinery is used. I say there has been much done, not only by the inspector, but by the manufacturers as well. A person with no experience in the matter thinks this is a small matter and says it will cost only, perhaps, two hundred dollars, but when we come to know the sum total, it may reach over one thousand, in some cases. I know of one case, where the expense was estimated at about four hundred dollars, but before good results were obtained from said blowers, it had cost over six thousand dollars. Some would say this was impossible, but take notice of the statement made "before good results were obtained." In the first place after the blowers had been put in, it was found necessary to increase the speed of the fan, in order to create more draught to draw the dust out of the pipes. When the speed was increased, then they found their engine was not able to run it with other machinery. Then they purchased a new engine. When that was put in operation, they discovered their boilers were not sufficient for the demand of steam necessary. This compelled them to order two new boilers, then when they got them in position to use they found they had a good plant. Everything is now working nicely. This is, of course, an extreme case, but there are many similar ones; still they are a necessity, especially where metal and brass polishing is done, and I find usually the manufacturers realize this fact and pay a great amount of attention to it. There are now only three cases in my district where I consider they are necessary. Two have been ordered within the past month and the other is a case where the firm have been making a change, and are now looking for another building; however, when busy times come if they have not found a place to suit them, I shall insist upon their taking care of their dust.

As to ventilation, I do not think there is a city that can boast of better ventilation than can be found in our factories. Many of our large ones have spent a large amount of money putting in various systems, that change the air at certain periods and keep it as pure as can be, while others take great pains in locating the work rooms in the most airy part of the building. The only class of people here, who do not have good ventilation are the rag pickers. Their shops are usually close and very dusty, but we have no law, that I know of, that will reach them. They operate no machinery, but still come within the factory law.

CHILD LABOR.

I am glad to report this year that, in relation to the employment of children, the manufacturers have been more careful about the ages and procuring the necessary certificate from parents before they are allowed to go to work. I think the methods adopted by many of our large manufacturies at your suggestion, to compel parents, who try to get children of doubtful age into factories, to make a sworn statement, has been of great benefit to all concerned. This should be included in section 2 of the factory law, then we could punish the parents when we find false certificates.

I have had to investigate a few cases this year where I was suspicious of their not being of legal age and in several cases found the certificates were false. When confronted by a statement from the church records, the parents usually surrender and make some lame excuse to get out of it the best they can.

I have had only two prosecutions this year for violating this section of the law. The results of these two cases no doubt has had good effect upon some who have been looking after cheap help and have been careless in regard to the help they get, looking more to the price they pay than to the compliance with the law.

The chief reason I have not found more child labor this year is owing to the fact there has not been work for those who are 16 and over, and for that reason I would deal more severely with a person found employing a child under age than heretofore. I do not think there will be as much trouble in the future as in the past.

ACCIDENTS.

This is a matter I have watched closely this year. One reason is I want to know all the accidents that happen in my district and all the particulars in regard to them, for I believe it is the inspector's business to know all about every factory accident in his district; by so doing he will be better qualified to offer suggestions in order to guard against the same happening in other places. The second reason for wanting this information is because the inspector is supposed to ascertain and make a report of all accidents that happen during the year. The third reason is I want to know whether factory inspection lessens the number of accidents in factories. This seems to me to be the best reason why the inspector should be familiar with everything in this department of his work, but we shall not get it until our law is so amended that the manufactories shall be compelled to make a report of all accidents either to the chief inspector or his deputy in a given time. Then we could make accurate reports, but when the inspector asks the manager how many accidents has happened in his factory during the year, he answers, not any, and at the same time we have information of three killed, in that factory. This looks discouraging for an accurate account. I do not stop there, but it requires a great amount of time to go to the homes of those who have been injured in order to get necessary facts when refused out and out at the factories.

As I stated heretofore, I have watched this matter very closely all through the year and have investigated a good many cases and causes.

Where I hear of an accident, or see a newspaper report of one, I take note of all the information I can get at the time and file it in a book kept for that purpose, until I visit the factory or make an investigation of the case. I also have the privilege of searching the insurance records in some cases where I get full particulars of the case.

The elevator comes in for its share of accidents this year in my district. Some cases were through gross carelessness on the part of the operator and others through lack of providing proper protection to avoid accidents.

I report 60 accidents of all kinds which I have found during this year; 6 of them were fatal, and 7 were elevator accidents.

GUARDING MACHINERY.

The law relating to the guarding of belting, gearing, set screws, etc., is one that requires a constant watch on the part of the inspector, especially in the small factories. In the large ones I have found very few occasions this year to make any recommends in this respect. Every thoroughly experienced superintendent knows the danger connected with swift running machinery when it has not the best system of guards. Such men only need to have their attention called to this matter once.

As I entered one of our finest equipped factories last year, I met the superintendent and told him my mission. He said, "Well, we are in just the same shape we were last year, when you went through our works and we have no children and need no fire escapes." "Well," said I, "it will be necessary for me to look over your elevators and machinery, if nothing more, the latter especially. I want to see how many set screws there are here, projecting in such a manner they are liable to take the clothes off of some of your men." He said to me afterwards "When you mentioned set screws, it made my hair raise." He thought at once "That is a matter I have never thought of around our works." He went over all their machinery with me and we found some, too, but they were soon taken care of.

I have given special attention to this department of our work this year, but have found less cause for orders than last year and these given for better protection against accident have been cheerfully received, and complied with, as far as I have been able to revisit and ascertain. I find, however, in many factories there is a constant change in the machinery. When this is done, the guards are removed, then, when the machine has been set up again, the guards are forgotten until the inspector appears.

FIRE ESCAPES.

The matter of fire escapes has not given me much trouble this year, as I consider all factories in my district well provided with means of exit, except two where I ordered escapes put up during this month.

As a rule, people who own large buildings here do not hesitate to make ample provision for escape in case of fire, when the buildings are constructed. The outside fire escapes which hang on the walls are not much favored by those who build the modern factory. It takes too long to empty a large building of its inmates in case of fire with this system. Another objection to them is where female help is employed; they seldom have been known to use an outside escape where they have been provided and in good condition at time of fire. I reported during the year the case of Agnes Tetters who was burned in a factory where they had good outside facilities for escape, but most females are very suspicious about using any means outside of the walls for an escape. I have had many cases reported to me that needed fire escapes when upon examination found the places provided as well as they could be unless they were all rebuilt. When I question my informants they say "we could never go down that fire escape," etc.

Most of our new factories have the safest escape possible. It consists of stairways incased with four brick walls, with iron covered doors at each floor. In case of a fire on any floor these doors are closed, then the employés go down these stairs as though they were going to lunch. This to my mind is the safest fire escape manufactured.

CONCLUSION.

In conclusion, I would say, the factory law has been well received during the year, and in most cases the inspector and his orders have had the same attention. The employers are usually heart and hand with us in our work, and often say, "If there is anything out of order in our factory, we want to know it soon as you have made your inspection and we will rectify it." I find the managers, superintendents, in fact all who look into the matter, are growing in favor of the law each year.

One manager said to me as I presented myself before him and made my business known. "What is the use now of your going through my factory, then go away,—that is all there is of it; if we had a law similar to that in New York State (he was formerly a resident of that State) where the State appoints a man to make an inspection, and tells you just what to do, then the manufacturer has to do it." So he went on and described the factory law in all its details. I waited until he had finished, then I said, "You think that is a good law, do you"? "Yes, sir," said he, "One we ought to have in this State." "Well," said I, "I am here to enforce just that kind of a law, and am surprised that you, a manufacturer, do not know more about the laws of your own State as well as those of our sister State." However, the manufacturers are becoming more familiar with the factory inspection law, and are beginning to realize they are deriving some benefit from it, as well as employés. While much has been accomplished, when I look over the field I see there yet remains much to do in a district like this, where there are over 1,100 factories that come under the factory law; still should the same progress be made as in the last twelve months, by the end of next year will find the factories in this city in a very good condition. I beg leave to sincerely thank you for the many kindnesses shown me and for good, sound advice given me from time to time, which has been so helpful to me in my work.

Yours very truly,
W. F. TRIPP,
Deputy Inspector.

Inspection book No. 1. **TABLE No. 1.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
1	Jan. 27	Detroit	Traugott, Schmidt & Sons	Leather and wool	run.	full
2	" 28	"	Detroit Daily Abend Post	Newspaper	"	"
3	" 28	"	H. W. Rickel & Co.	Malt and grain	"	"
4	" 28	"	J. G. Unsoeld	Carriages	"	"
5	" 28	"	R. R. Johnson	Boxes	"	part
6	" 29	"	H. W. Rickel & Co.	Malt	"	full
7	" 29	"	The St. Aubin Constr'n Co.	Cut stone	"	"
8	" 29	"	Detroit Brewing Co.	Lager beer	"	"
9	" 29	"	Ekhardt & Becker Brew. Co.	Bottled beer	"	"
10	" 29	"	Ekhardt & Becker Brew. Co.	Lager beer	"	"
11	" 30	"	Mutual Brewing Co.	" "	"	"
12	" 30	"	Geo. Moebs & Co.	Cigars	"	"
13	" 30	"	T. Zoltowski	Lager beer	"	"
14	" 30	"	White Eagle Brewery	" "	"	"
15	" 30	"	Citizen's Cigar Co.	Cigars	"	"
16	" 31	"	Home Brewing Co.	Beer	"	"
17	" 31	"	Westphalia Brewery	Lager beer	idle	......
18	" 30	"	Germania Brewing Co.	Beer	run.	full
19	" 31	"	Michigan Bottling Works	Bottled beer	"	"
20	" 31	"	Columbia Brewing Co.	Beer	"	"
21	" 30	"	Central Brewing Co.	"	"	"
22	Feb. 3	"	C. W. Johnson & Co.	Printed matter	"	"
23	" 3	"	J. R. Burton	" "	"	"
24	" 3	"	Jaenichen M'f'g Co.	Cash registers	"	"
25	" 3	"	W. F. Moore	Printed matter	"	"
26	" 4	"	W. H. Swail Printing Co.	Book b'nd & prin. mat.	"	"
27	" 4	"	The Franklin Press	Printed matter	"	"
28	" 4	"	James Markey	" "	"	"
29	" 5	"	The Thos. Smith Press	" "	"	"
30	" 5	"	Chas. M. Rousseau	" "	"	"
31	" 5	"	Handford Printing Co.	Job printing	"	"
32	" 5	"	The Sunday Sun	Newspaper	"	"
33	" 5	"	C. H. Rule	Job printing	"	"
34	" 6	"	St. Louis Brewing Co.	Beer	"	"
35	" 6	"	Herman Guyman	Cigars	"	"
36	" 6	"	The Voigt Brewery Co.	Beer	"	"
37	" 6	"	The Voigt Bottling Works	Bottled beer	"	"
38	" 7	"	Alex. Gordon	Cigars	"	"
39	" 7	"	Chas. Marks	Tailor made goods	"	"
40	" 7	"	M. Reichstein	Rags and iron	"	"
41	" 7	"	Ph. Nagel Brewery	Beer	"	"
42	" 7	"	Charles H. Tee	Cigars	"	"
43	" 8	"	C. Pfeiffer Brewery	Beer	"	"
44	" 8	"	F. W. Wagner	Barrels	"	"
45	" 8	"	Geo. Bloss Brewery	Beer	"	"
46	" 8	"	Brotherton, Breitmeyer & Co	Seeds	"	"
47	" 10	"	Honer's Brewery	Beer	"	"
48	" 10	"	D. A. C. Cigar Factory	Cigars	"	"
49	" 10	"	Koppitz & Melcher's B'tl. W's.	Bottled Beer	"	"
50	" 10	"	Koppitz & Melcher's Brew. Co.	Beer	"	"

District No. 1. ***W. F. Tripp, Deputy Inspector.***

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water-closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	120	119	1	$3,200	....	2	yes	10	60	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	1	1
54	54	35	35	....	2,000	....	....	......	9	60	....	no	"	"	"	"	"	"	"	"	....	....	2
60	60	10	10	....	400	....	....	......	10	60	yes	....	no	"	"	"	"	"	"	"	....	....	3
60	60	6	4	....	140	....	....	......	10	45	....	....	yes	"	"	†	....	....	....	"	....	....	4
60	54	10	5	....	200	....	....	......	10	*30	no	no	no	"	"	†	yes	yes	yes	"	....	....	5
72	72	12	12	....	450	....	....	......	10	60	yes	....	yes	"	"	yes	"	"	"	"	....	....	6
54	54	20	9	....	500	....	....	......	9	60	....	....	....	"	"	†	....	....	"	"	....	....	7
60	60	25	25	....	1,600	....	....	......	10	60	yes	....	yes	"	"	yes	yes	yes	"	"	....	....	8
60	60	8	5	3	300	....	....	......	10	60	....	....	"	"	"	†	....	....	"	"	yes	....	9
60	60	25	25	....	1,500	....	....	......	10	60	yes	....	"	"	"	yes	yes	yes	"	"	....	....	10
60	60	5	5	....	280	....	....	......	10	60	"	....	"	"	"	"	"	"	"	"	....	....	11
54	54	160	40	120	5,000	....	8	yes	9	*30	....	no	"	"	"	"	....	....	"	"	yes	....	12
60	60	5	5	....	270	....	....	......	10	60	yes	....	"	"	"	"	yes	yes	"	"	....	....	13
60	60	26	26	....	1,450	....	....	......	10	60	"	....	"	"	"	"	"	"	"	"	....	....	14
48	48	12	5	....	240	....	....	......	8	60	....	....	....	"	"	....	....	....	....	"	....	....	15
60	60	10	10	....	500	....	....	......	10	60	yes	....	yes	"	"	yes	yes	yes	yes	"	....	....	16
60	....	10	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	17
60	60	7	5	....	310	....	....	......	10	60	yes	....	yes	yes	no	†	yes	yes	yes	yes	....	....	18
60	60	4	4	....	150	....	....	......	10	60	....	....	"	"	"	†	"	"	"	"	....	....	19
60	60	7	7	....	370	....	....	......	10	60	yes	....	no	"	"	yes	"	"	"	"	....	....	20
60	60	4	4	....	200	....	....	......	10	60	"	....	yes	"	"	†	"	"	"	"	....	....	21
54	54	6	5	....	2 0	....	....	......	9	45	....	....	"	"	"	yes	"	"	"	"	....	....	22
54	54	5	5	....	200	....	....	......	9	60	....	....	"	"	"	"	"	"	"	"	....	....	23
57	57	15	10	....	550	....	....	......	9½	*30	....	no	"	"	"	"	"	"	"	"	....	....	24
54	54	10	5	....	210	....	....	......	9	60	....	....	"	"	"	"	"	"	"	"	....	....	25
54	54	6	6	....	300	....	....	......	9	60	....	--	"	"	"	†	"	....	"	"	....	....	26
54	54	6	5	1	250	....	....	......	9	60	....	....	"	"	"	yes	"	....	"	"	yes	....	27
54	54	6	6	....	280	....	....	......	9	60	....	no	"	"	"	†	"	....	"	"	....	....	28
54	54	22	7	....	300	....	....	......	9	60	....	"	"	"	"	yes	"	....	"	"	....	....	29
54	54	12	6	....	250	....	....	......	9	60	....	"	"	"	"	†	"	....	"	"	....	....	30
54	54	8	6	....	285	....	....	......	9	60	....	--	"	"	"	†	"	....	"	....	....	....	31
48	48	24	11	1	500	....	....	......	8	60	....	yes	"	"	"	†	"	....	"	....	no	....	22
54	54	6	5	....	200	....	1	yes	9	60	....	....	....	"	"	†	"	....	"	....	....	....	33
60	60	10	10	....	500	....	....	......	10	60	....	....	yes	"	"	†	"	....	"	yes	....	....	34
54	54	8	4	1	170	....	....	......	9	60	....	....	"	"	"	†	....	....	....	"	yes	....	35
60	60	40	32	....	2,000	....	....	......	10	60	....	no	"	"	"	yes	yes	....	yes	"	....	....	36
60	60	12	12	....	400	....	....	......	10	60	....	"	"	"	"	"	"	....	"	"	....	....	37
48	48	240	35	75	......	....	7	no	9	60	....	yes	"	"	"	"	"	....	"	"	yes	1	38
54	54	12	4	....	150	....	....	......	9	60	....	....	"	"	"	†	....	....	....	"	....	....	39
54	54	14	2	12	350	....	....	......	9	*30	....	....	"	"	"	yes	....	....	....	"	yes	....	40
60	60	5	5	....	265	....	....	......	10	60	....	....	"	"	"	†	yes	....	yes	"	....	....	41
54	54	12	2	2	150	....	....	......	9	60	....	....	"	"	"	†	....	....	....	"	yes	....	42
60	60	13	13	....	625	....	....	......	10	60	....	....	"	"	"	†	yes	....	yes	"	....	....	43
54	54	30	24	....	1,000	....	....	......	9	*30	....	....	....	"	"	....	....	....	....	"	....	....	44
60	60	5	5	....	260	....	....	......	10	60	....	....	yes	"	"	†	yes	....	yes	"	....	....	45
54	54	14	5	9	450	....	....	......	9	60	....	no	"	"	"	no	"	....	"	"	yes	....	46
60	60	4	4	....	200	....	....	......	10	60	....	....	no	"	"	†	"	....	"	"	....	....	47
48	48	20	10	7	550	....	2	yes	8	60	....	....	yes	"	"	yes	....	....	....	"	no	....	48
60	60	18	6	3	280	....	....	......	10	*30	yes	....	"	"	"	†	yes	....	yes	"	yes	....	49
60	60	28	28	....	1,250	....	....	......	10	60	"	....	"	"	"	yes	"	yes	"	"	....	....	50

* Permit given by inspector. † None required.

Inspection book No. 2. **TABLE NO. 1.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
51	Feb.	11	Detroit	B. Stroh Brewing Co.	Lager beer	run.	full
52	“	11	“	B. Stroh Brewing Co.	Bottled beer	“	“
53	“	11	“	A. Ruoff Brewing Co.	Lager beer	“	“
54	“	11	“	Phœnix Brewery	“ “	“	“
55	“	11	“	C. Schick	Cigars	“	“
56	“	12	“	Ph. Kling Bottling Works	Bottled beer	“	“
57	“	12	“	Ph. Kling Brewing Co.	Lager beer	“	“
58	“	12	“	J. M. Enderlin	Cigars	“	“
59	“	12	“	John Wacker	Barrels and casks	“	“
60	“	12	“	Hutteman & Cramer Co.	Brewers & brick mach'y.	“	“
61	“	12	“	E. Fuchs & Son	Wooden faucets, etc.	“	“
62	“	13	“	D. Epstein	Rags	“	“
63	“	13	“	M. Jacobson	“	“	“
64	“	13	“	J. C. Cobb	Stone	idle	......
65	“	13	“	John Malcho	Horse collars	run.	full
66	“	13	“	Canto Bros.	Cigars	“	“
67	“	14	“	A. Simon & Co.	Rags	“	“
68	“	14	“	Jacob Freedman	“	“	“
69	“	14	“	Jacob Lundon	Tailor made goods	“	part
70	“	14	“	Detroit Bed'g & Upholst'g Co.	Mattresses and pillows.	“	full
71	“	14	“	W. S. Piggins	Cut stone	“	“
72	“	15	“	Star Carpet Cleaning Works	Cleaning carpets	“	“
73	“	15	“	Golze & Co.	Bottled beer	“	“
74	“	15	“	S. Harris	Rags	“	“
75	“	17	“	L. M. Peters Carpet & Rug Mfg. Co.	Rugs and carpets	“	part
76	“	17	“	The East Side Brewing Co.	Lager beer	“	full
77	“	17	“	A. Muer	Cigars	“	“
78	“	17	“	A. Funke	Bottled beer	“	“
79	“	17	“	Plymouth Rock Pants Co.	Men's pants	“	“
80	“	18	“	Detroit Can Co.	Tin cans	“	part
81	“	18	“	Jacob Burnstein & Co.	Rags	“	full
82	“	18	“	Fred Myll	Sort paper	“	“
83	“	18	“	New Method Laundry	Laundry work	“	“
84	“	19	“	J. P. Benoit	Machinery	idle	......
85	“	19	“	Western Cigar Box Co.	Cigar boxes	run	full
86	“	19	“	Pioneer Glass & Novelty Co.	Mirrors and reed chairs	“	part
87	“	19	“	George Goldstein	Cleaning carpets	“	“
88	“	19	“	Pullman Palace Car Works	Sleeping cars	idle	......
89	“	19	“	P. Stenius	Baskets	run	part
90	“	20	“	Reichle Carriage & Wagon Co.	Wagons and carriages	“	full
91	“	20	“	J. J. Watson	Cigars	“	“
92	“	20	“	F. A. Decker	Furniture	“	part
93	“	20	“	Mich. Whitefish Hatchery No. 1	Fish	“	full
94	“	20	“	P. S O'Dea Factory	Boot and shoe uppers	“	“
95	“	21	“	Valentine Schroeder	Candy	“	“
96	“	21	“	H. H. Stender	Cigars	idle	......
97	“	21	“	Cabinet Cigar Co.	“	run	full
98	“	24	“	Castle Steam Laundry	Laundry work	“	“
99	“	24	“	Barie & Saladin	Baked goods	“	“
100	“	24	“	M. F. Hope & Co.	Woolen rags	“	“

District No. 1. ***W. F. Tripp, Deputy Inspector***

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire-escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	81	81	....	$3,800	....	....	......	10	60	yes	....	yes	yes	no	yes	yes	yes	yes	yes	....	....	51
60	60	40	18	6	900	....	....	......	10	60	"	no	"	"	"	†	"	"	"	"	yes	..	52
60	60	14	12	....	800	....	....	......	10	60	....	....	"	"	"	yes	"	"	"	"	....	....	53
60	60	8	7	....	400	....	....	......	10	60	....	...	"	"	"	†	"	"	....	"	....	....	54
54	54	5	3	1	175	....	....	......	9	60	....	....	....	"	"	†	....	....	....	"	yes	....	55
60	60	8	6	2	400	....	....	......	10	60	...	no	yes	"	"	yes	yes	yes	yes	"	"	....	56
60	60	27	27	....	1,600	....	....	......	10	60	....	"	"	"	"	"	"	"	"	"	....	....	57
48	48	5	5	....	250	....	....	......	8	60	....	....	"	"	"	†	....	....	....	"	....	....	58
60	60	20	10	....	370	....	....	......	10	60	....	....	"	"	"	†	yes	yes	yes	"	....	....	59
60	60	40	30	....	1,200	....	....	......	10	45	yes	....	"	"	"	yes	"	"	"	"	....	....	60
60	60	5	4	....	175	....	....	......	10	60	....		"	"	"	†	"	....	"	"	....	....	61
54	54	24	3	21	600	....	....	......	9	60	yes	....	"	"	"	†	....	....	....	"	yes	....	62
54	54	12	2	6	225	....	....	......	9	60	no	....	"	"	"	yes	....	....	....	"	"	....	63
60	..	30	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	64
60	60	12	8	....	400	....	....	......	10	*30	....	....	yes	yes	no	†	....	....	....	yes	....	....	65
48	48	12	8	....	300	....	....	......	8	60	....	....	....	"	"	†	....	....	....	"	....	....	66
54	54	25	4	21	600	....	....	......	9	60	....	no	yes	"	"	yes	....	....	....	"	yes	...	67
54	54	12	2	6	200	....	....	......	9	60	yes	....	"	"	"	†	....	....	....	"	"	....	68
60	54	15	5	6	325	....	1	no	9	60	....	....	....	"	"	†	....	....	....	"	"	....	69
60	60	12	8	2	360	....	1	"	10	*30	....	no	yes	"	"	yes	yes	....	yes	"	no	....	70
54	54	30	15	....	800	....	....	......	9	60	....	....	....	"	"	†	"	....	"	"	....	....	71
60	60	6	6	....	230	....	...	......	10	60	....	....	yes	"	"	†	"	....	"	"	....	....	72
60	60	4	4	....	200	....	....	......	10	60	....	....	"	"	"	†	"	....	"	"	....	....	73
54	54	10	4	6	275	....	....	......	9	60	yes	....	"	"	"	†	....	....	....	"	yes	....	74
60	48	12	3	3	180	....	....	......	10	*30	....	....	"	"	"	†	yes	yes	yes	"	"	....	75
60	60	6	6	....	300	....	....	......	10	60	....	....	"	"	"	†	"	"	"	"	....	....	76
48	48	14	10	2	550	....	....	......	8	60	....	....	"	"	"	†	....	....	....	"	yes	....	77
60	60	5	4	....	180	....	....	......	10	60	....	....	"	"	"	†	....	....	....	"	....	....	78
54	54	12	4	2	185	....	1	yes	9	60	....	....	....	"	"	†	....	....	yes	"	yes	....	79
60	48	100	50	....	1,000	....	17	no	10	*30	....	no	yes	"	"	yes	yes	....	"	"	....	....	80
54	54	24	3	16	500	....	....	......	9	60	....	....	"	"	"	"	....	....	"	"	yes	....	81
54	54	14	3	10	350	....	....	......	9	60	yes	....	"	"	"	"	....	....	"	"	"	....	82
54	54	6	2	2	130	....	....	......	9	60	....	....	....	"	"	†	yes	....	"	"	"	....	83
60	..	....	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	84
60	60	100	32	38	1,450	....	18	yes	10	*30	yes	....	yes	yes	no	†	yes	....	yes	yes	yes	....	85
60	54	12	4	1	300	....	....	......	10	45	"	....	"	"	"	yes	....	....	....	"	"	....	86
60	40	8	3	....	120	....	....	......	10	*30	"	....	"	"	"	†	yes	....	yes	"	....	....	87
60	..	600	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	88
60	40	12	4	....	150	....	....	......	10	*30	yes	....	yes	yes	no	yes	yes	....	yes	yes	....	....	89
60	60	10	6	....	275	....	....	......	10	*30	"	....	"	"	"	"	....	....	"	"	....	....	90
48	48	5	3	1	125	....	1	no	8	60	....	....	....	"	"	†	....	....	"	"	yes	...	91
60	48	8	4	....	160	....	....	......	10	*30	....	....	yes	"	"	†	....	....	"	"	....	....	92
60	60	4	4	....	225	....	....	......	10	60	....	...	"	"	"	†	....	yes	"	"	..	...	93
54	54	12	3	1	125	....	....	......	9	*30	....	....	"	"	"	yes	yes	....	"	"	yes	....	94
60	60	25	8	12	550	....	....	......	10	*30	....	no	"	"	"	"	"	....	"	"	"	....	95
48	..	....	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	96
48	48	25	13	5	750	....	1	yes	8	60	....	no	yes	yes	no	yes	....	....	yes	yes	yes	....	97
54	54	12	4	2	180	....	....	......	9	60	....	...	"	"	"	†	yes	....	"	"	"	....	98
54	54	14	10	..	500	....	....	......	9	60	....	yes	"	"	"	†	"	....	"	"	....	....	99
60	60	40	5	35	1,050	....	....	......	10	60	...	no	"	"	"	yes	....	....	"	"	yes	....	100

* Permit given by inspector. † None required.

Inspection book No. 3. **TABLE No. 1.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
101	Feb.	24	Detroit	Huebner Manufacturing Co.	Screen doors	run.	part
102	"	24	"	Robert Hutton & Co.	Metal cornice and r'f'g.	"	"
103	"	25	"	John Hoffman	Barrels	"	full
104	"	25	"	A. Doberstein	Potash	"	"
105	"	25	"	A. J. Hermann	Cigars	"	"
106	"	25	"	E. Marks Co.	Cigars	"	"
107	"	25	"	Wolverine Electric Co.	Dynamos	idle	......
108	"	25	"	Wolverine Saw Works	Saws	run.	full
109	"	26	"	Alaska Knitting Co.	Knit goods	"	"
110	"	26	"	C. Lingemann & Co.	Umbrellas and parasols	"	"
111	"	26	"	A. W. Brooks	Job printing	"	"
112	"	26	"	Sol. Berger	Cigars	"	"
113	"	26	"	Louis Ganger	Job printing	"	"
114	"	27	"	J. C. Hartz	Hats and caps	"	"
115	"	27	"	Detroit Metal Co.	Rags	idle	......
116	"	27	"	S. Elsey	Marble and granite	run.	full
117	"	27	"	H. Frankenstine	Cigars	"	"
118	"	27	"	Vienna Brewery Co.	Lager beer	"	"
119	"	27	"	West Side Brewery Co.	Lager beer	"	"
120	"	28	"	Loyal Am. Cigar Mf'g. Co.	Cigars	"	"
121	"	28	"	Wagner & Ernewein Tinware Mf'g. Co.	Tinware	"	part
122	"	28	"	J. P. Hensien	Tinware	"	"
123	"	28	"	John Lauer	Machinery	"	"
124	"	28	"	C. Wrench	Tin and slate roofing	"	full
125	"	29	"	M. Rubenstein	Cigarettes	"	"
126	"	29	"	Meyer, Davis & Co.	Rags and rubber	"	part
127	Mar.	2	"	Mardian Bros.	Wagons and carriages	"	"
128	"	2	"	S. Holz	Baked goods	"	full
129	"	2	"	John Hill	Wagons	"	part
130	"	2	"	Harcus & Lange	Building material	"	full
131	"	3	"	C. A. Lauhoff Roller Mills	Flour and feed	"	part
132	"	3	"	H. & A. Lauhoff Roller Mills	Flour and feed	"	full
133	"	3	"	John Pruma	Mens' clothing	"	part
134	"	3	"	Kioka & Junga	Mens' clothing	"	"
135	"	3	"	D. Karle	Tin and copper goods	"	"
136	"	3	"	C. Kaiser & Son	Leather and shoes	"	full
137	"	4	"	William Repp & Son	Tailor made goods	"	part
138	"	4	"	Geo. Zink	Clothing	"	"
139	"	4	"	H. W. Koehler	Carriages	"	"
140	"	4	"	H. Japes & Son	Sash, doors and blinds	"	"
141	"	4	"	Polish Weekly	Newspaper	"	full
142	"	4	"	A. G. Berkholz	Baskets	"	part
143	"	5	"	Ignatz Wolff	Tobacco and snuff	"	full
144	"	5	"	Peter Boden	Clothing	"	part
145	"	5	"	Detroit Rattan & Reed Wk's.	Baby carriages	"	"
146	"	5	"	A. G. Lamberg	Cigars	"	full
147	"	5	"	T. Funke	"	"	"
148	"	6	"	Besneatte & Zinn	"	"	"
149	"	6	"	Gustav Zinn	"	"	"
150	"	6	"	The Acme Fancy Wire Wk's.	Wire goods	"	"

District No. 1. *Wm. F. Tripp, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the ages of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded.	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	48	30	15	----	$600	----	----	------	19	*30	----	----	yes	yes	no	yes	yes	---	yes	yes	----	----	101
54	51	40	16	----	750	-- -	----	------	9	60	----	no	"	"	"	†	"	----	"	"	----	----	102
54	54	10	10	----	400	----	----	------	9	*30	----	----	----	"	"	†	----	----	"	"	----	----	103
60	60	5	4	----	180	----	----	------	10	*30	----	----	----	"	"	†	----	yes	"	"	----	----	104
48	48	6	2	----	75	----	----	------	8	60	----	----	----	"	"	†	----	----	"	"	-- -	----	105
48	48	12	5	2	300	----	----	------	8	60	----	----	yes	"	"	†	----	----	"	"	yes	----	106
60	..	12	----	----	------	----	----	------	----	--	----	----	----	----	----	----	----	----	----	----	----	----	107
60	60	10	4	----	250	----	----	------	10	60	----	----	----	yes	no	†	yes	yes	yes	yes	----	----	108
60	60	60	5	28	850	----	1	yes	10	*30	----	no	yes	"	"	yes	"	----	"	"	yes	----	109
60	60	10	6	2	250	----	1	"	10	60	----	----	"	"	"	†	----	----	"	"	"	----	110
54	54	7	5	----	200	----	----	------	9	60	----	----	"	"	"	†	yes	----	"	"	--	----	111
48	48	10	6	4	400	----	1	no	8	60	----	----	----	"	"	†	----	----	"	"	yes	----	112
54	54	4	3	----	125	----	----	------	9	60	----	---	yes	"	"	yes	yes	--	"	"	----	----	113
54	54	7	5	2	250	----	----	------	9	60	----	----	----	"	"	†	----	----	"	"	yes	----	114
60	..	20	----	----	------	----	----	--- -	----	----	----	----	----	----	----	----	----	----	----	----	----	----	115
54	54	12	5	----	250	----	----	------	9	60	----	----	----	yes	no	†	----	----	yes	yes	----	----	116
48	48	8	2	----	75	----	----	------	8	60	----	----	yes	"	"	†	----	----	"	"	----	----	117
60	60	20	10	----	550	----	----	------	10	60	----	----	"	"	"	†	yes	yes	"	"	----	----	118
60	60	22	20	----	1,200	----	----	------	10	60	----	----	"	"	"	†	"	"	"	"	----	----	119
54	54	12	5	1	270	----	----	------	9	60	----	----	----	"	"	†	----	----	"	"	yes	----	120
60	54	6	6	1	250	----	----	------	10	60	----	----	----	"	"	†	----	----	"	"	"	----	121
60	54	60	45	----	1,600	----	1	yes	10	*30	----	----	yes	"	"	yes	yes	----	"	"	----	----	122
60	54	50	25	----	1,250	----	----	------	10	60	----	---	"	"	"	"	"	----	"	"	----	----	123
54	54	10	5	----	225	----	----	------	9	60	----	----	----	"	"	†	----	----	"	"	----	----	124
54	54	7	3	1	170	----	----	------	9	60	----	----	----	"	"	†	----	----	"	"	yes	----	125
60	54	18	3	13	375	---	----	------	10	60	----	no	yes	"	"	†	----	----	"	"	"	----	126
60	54	12	10	----	500	----	----	------	10	*30	----	"	"	"	"	yes	yes	----	"	"	----	----	127
60	60	6	5	1	230	----	----	------	10	60	----	----	----	"	"	†	"	----	"	"	yes	----	128
60	54	6	5	----	190	----	----	------	10	*30	-- -	----	yes	"	"	†	----	----	"	"	----	----	129
54	54	80	26	1	1,050	----	----	------	9	*30	----	----	"	"	"	yes	yes	yes	"	"	yes	----	130
60	48	4	4	----	160	----	----	------	10	60	----	----	"	"	"	"	"	"	"	"	----	----	131
60	60	4	3	----	150	----	----	------	10	60	----	----	"	"	"	†	"	"	"	"	----	----	132
60	48	20	3	8	250	----	2	yes	10	*30	----	----	"	"	"	†	"	----	"	"	yes	----	133
60	48	12	2	2	150	----	----	------	10	*30	----	----	"	"	"	†	"	----	"	"	"	----	134
60	48	10	4	----	200	----	----	------	10	*30	----	----	----	"	"	†	----	----	"	"	----	----	135
60	60	30	12	3	350	----	1	yes	10	45	----	----	yes	"	"	†	yes	yes	"	"	yes	----	136
60	54	8	3	1	130	----	----	------	10	60	----	----	----	"	"	†	"	---	"	"	"	----	137
60	48	12	3	2	150	----	----	------	10	*30	----	----	yes	"	"	†	"	----	"	"	"	----	138
60	54	6	3	----	120	----	----	------	10	*30	----	----	"	"	"	†	----	----	"	"	----	----	139
60	48	20	8	----	300	----	----	------	10	*30	----	----	"	"	"	†	yes	yes	"	"	----	----	140
60	60	5	4	----	125	----	2	yes	10	60	----	----	"	"	"	†	"	"	"	"	----	----	141
60	48	10	3	1	160	----	----	------	10	*30	----	----	"	"	"	†	"	"	"	"	yes	----	142
60	60	6	4	----	130	----	----	------	10	60	yes	----	"	"	"	†	"	"	"	"	----	----	143
60	48	12	2	5	225	----	----	------	10	*30	----	----	"	"	"	†	"	----	"	"	yes	----	144
60	48	6	2	1	100	----	----	------	10	60	----	----	"	"	"	†	----	----	"	"	"	----	145
48	48	12	5	2	200	----	----	------	8	60	----	----	"	"	"	†	----	----	"	"	"	----	146
48	48	8	4	1	175	----	----	------	8	60	----	----	"	"	"	†	----	----	"	"	"	----	147
48	48	6	4	----	200	----	--	------	8	60	----	----	"	"	"	†	----	----	"	"	----	----	148
48	48	6	4	1	200	- -	----	------	8	60	----	----	"	"	"	†	----	----	"	"	yes	----	149
60	60	10	6	----	150	1	2	no	10	*30	----	---	----	"	"	†	----	----	"	"	----	----	150

*** Permit given by inspector.** **† None required.**

Inspection book No. 4. **TABLE No. 1.—Continued.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
151	Mar. 6	Detroit	John Kellner	Cigars	run.	full
152	" 6	"	H. G. Jonas	Baskets	"	part
153	" 10	"	Chas. Manzelmann	Brooms	"	full
154	" 10	"	Krentler Bros.	Boot and shoe lasts	"	"
155	" 10	"	Bock, Schoeneweg & Gast	Furniture	"	part
156	" 10	"	Meier Bros. & Co.	Stone	"	full
157	" 10	"	A. Van Slambrouck	Chicory	"	part
158	" 10	"	The Improved Match Co.	Matches	"	full
159	" 11	"	J. J. Manthey	Brooms	"	part
160	" 11	"	A. Schmid	Macaroni	"	"
161	" 11	"	F. De Galan & Son	Wooden ware	"	"
162	" 11	"	James Hartness	Soap and potash	"	"
163	" 11	"	Detroit Chicory Co.	Chicory	"	"
164	" 12	"	J. H. Molitor	Cigars	"	full
165	" 12	"	Wm. Sauer & Son	Barrels	"	part
166	" 12	"	Knapp Bros.	Cigars	"	full
167	" 12	"	J. Diesing	Furniture	"	"
168	" 12	"	M. Davis	Rags and metal	"	part
169	" 12	"	Silver Star Cigar Co.	Cigars	"	full
170	" 13	"	Eagle Steam Carpet Cl'ing Wk's	Cleaning carpets	"	part
171	" 13	"	Chas. Marks	Men's clothing	"	"
172	" 13	"	L. H. Beck & Son	Wool and hides	"	"
173	" 13	"	J. D. Candler & Co.	Roofing	"	full
174	" 13	"	C. F. Graulich	Horse collars	"	part
175	" 13	"	J. Gumbinsky	Rags	"	"
176	" 16	"	The Buehler Valve Co.	Steam valves	"	"
177	" 16	"	M. Schiffman	Rags	"	"
178	" 16	"	East End Iron Foundry	Castings	"	full
179	" 16	"	C. Walz Foundry	Brass goods	"	part
180	" 16	"	S. Silverstine	Clothing	"	"
181	" 16	"	Mike Lenhoff	Men's clothing	"	full
182	" 16	"	C. Pokorny	Cigars	"	"
183	" 17	"	John Reuter	Rags	"	part
184	" 17	"	Champion Brewery	Beer	"	full
185	" 17	"	Adolph Luttermoser	Clothing	"	"
186	" 17	"	O. G. Schmidt	Baked goods	"	"
187	" 17	"	John Zink	Clothing	"	"
188	" 18	"	J. N. Dodge	Oars and decoy ducks	"	part
189	" 18	"	Harris & Finklestein	Slippers	idle	......
190	" 18	"	J. P. Krejci	Beer kegs	run.	full
191	" 18	"	M. A. Labinski	Clothing	"	part
192	" 18	"	Thomas Skoda	"	"	"
193	" 18	"	Hardenberg & Johnson	Cooperage	"	"
194	" 18	"	J. V. Vodrashka	Clothing	"	full
195	" 19	"	P. P. Sobieski	"	"	part
196	" 19	"	Mich. Smelt'g and Refining Wk's	Metal	idle	......
197	" 19	"	T. De Claire	Clothing	run.	part
198	" 20	"	E. H. Flaherty	Cigars	"	full
199	" 20	"	Sam Goldwater	"	"	"
200	" 20	"	Home of Industry	Chairs and repairing	"	part

District No. 1. *Wm. F. Tripp, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
48	48	4	2	1	$100	----	----	------	8	60	----	----	----	yes	no	†	----	----	yes	yes	yes	----	151
48	60	10	4	----	125	----	----	------	10	60	----	----	----	"	"	†	----	----	"	"	----	----	152
60	60	24	24	----	900	----	----	------	10	*30	----	----	yes	"	"	†	yes	yes	"	"	--	----	153
60	60	18	18	----	650	----	----	------	10	*30	yes	yes	"	"	"	†	"	no	"	"	----	----	154
60	54	24	18	----	800	----	1	yes	10	*30	----	no	no	"	"	†	"	"	"	"	----	----	155
54	54	20	5	----	300	----	----	------	9	60	----	----	----	"	"	†	----	----	"	"	----	----	156
60	54	4	3	1	125	----	----	------	10	60	----	----	yes	"	"	†	yes	yes	"	"	yes	----	157
60	60	110	65	30	3,000	----	17	no	10	*30	----	yes	"	"	"	no	"	"	"	"	"	4	158
60	54	6	3	----	100	----	----	------	10	60	----	----	"	"	"	†	"	"	"	"	----	----	159
60	48	6	4	1	180	----	----	------	10	60	----	yes	"	"	"	†	"	"	"	"	yes	----	160
60	54	8	5	----	200	----	----	------	10	*30	----	----	"	"	"	†	"	"	"	"	----	----	161
60	48	10	4	----	150	----	----	------	10	60	----	----	"	"	"	†	"	"	"	"	----	----	162
60	48	30	5	5	200	----	3	yes	10	*30	----	no	"	"	"	†	"	"	"	"	yes	----	163
48	48	8	4	1	160	----	----	------	8	60	----	----	"	"	"	†	----	----	"	"	"	----	164
60	48	41	41	----	1,500	----	----	------	10	*30	----	----	"	"	"	†	----	----	"	"	----	1	165
48	48	6	4	----	200	----	----	------	8	60	----	----	----	"	"	†	--	----	"	"	----	----	166
60	60	6	3	----	110	----	1	yes	10	*30	----	----	yes	"	"	†	yes	yes	"	"	----	----	167
60	54	21	3	18	550	----	----	------	10	60	yes	no	"	"	"	yes	----	----	"	"	yes	----	168
48	48	10	5	2	180	----	1	yes	8	60	----	----	"	"	"	†	----	----	"	"	"	----	169
60	48	4	3	----	120	----	----	------	10	60	----	----	"	"	"	†	yes	----	"	"	----	----	170
60	54	12	5	2	250	----	1	no	10	*30	----	----	"	"	"	†	"	yes	"	"	yes	----	171
60	48	20	4	----	175	----	----	------	10	*30	----	----	"	"	"	†	----	"	"	"	----	----	112
54	54	30	15	----	550	----	----	------	9	*30	----	----	"	"	"	†	----	----	"	"	----	----	173
60	54	6	4	----	150	----	----	------	10	60	----	----	"	"	"	†	----	----	"	"	----	----	174
60	54	15	2	12	825	----	----	------	10	*30	----	no	"	"	"	yes	----	----	"	"	yes	----	175
60	54	12	6	----	300	----	----	------	10	*30	----	----	"	"	"	†	yes	yes	"	"	----	----	176
60	54	17	2	12	300	----	----	------	10	*30	yes	----	"	"	"	†	----	----	"	"	yes	----	177
60	60	8	4	----	200	----	----	------	10	*30	----	----	"	"	"	†	yes	yes	"	"	----	----	178
60	54	5	3	----	150	----	----	------	10	*30	----	----	----	"	"	†	----	----	"	"	----	----	179
60	48	15	3	1	125	----	----	------	10	*30	----	----	yes	"	"	†	yes	yes	"	"	yes	----	180
60	60	10	2	6	200	2	2	no	10	*30	----	----	----	"	"	†	"	"	"	"	"	----	181
48	48	5	1	1	80	----	----	------	8	60	----	----	----	"	"	†	----	----	"	"	"	----	182
60	54	12	2	4	125	----	----	------	10	*30	no	----	yes	"	"	†	----	----	"	"	"	----	183
60	60	8	6	----	300	----	----	------	10	60	yes	----	"	"	"	†	yes	yes	"	"	----	----	184
60	60	14	3	7	300	----	----	------	10	*30	----	----	"	"	"	†	"	"	"	"	yes	----	185
60	60	6	2	2	125	----	----	------	10	60	----	----	----	"	"	†	----	----	"	"	"	----	186
60	60	10	1	2	100	----	----	------	10	*30	----	----	----	"	"	†	yes	yes	"	"	"	----	187
60	54	15	6	3	825	----	----	------	10	45	----	----	yes	"	"	yes	"	"	"	no	"	----	188
60	--	7	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	189
60	60	8	4	----	150	----	----	------	10	60	----	----	----	yes	no	†	----	----	yes	yes	-- -	----	190
60	54	6	2	1	110	----	----	------	10	60	----	----	yes	"	"	†	yes	yes	"	"	yes	----	191
60	54	8	1	2	100	----	----	------	10	*30	----	----	"	"	"	†	"	"	"	"	"	----	192
60	54	5	4	----	180	----	----	------	10	*30	----	----		"	"	†	----	----	"	"	----	----	193
60	60	6	2	3	175	----	----	------	10	*30	----	----	----	"	"	†	yes	yes	"	"	yes	----	194
60	54	6	2	2	120	----	----	------	10	*30	----	----	----	"	"	†	"	"	"	"	"	----	195
60	--	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	196
60	54	8	2	4	170	----	----	------	10	*30	----	----	yes	yes	no	†	yes	yes	yes	yes	yes	----	197
48	48	6	2	1	100	----	----	------	8	*30	----	----	"	"	"	†	----	----	"	"	"	----	198
48	48	10	5	1	200	----	----	------	8	60	----	----	----	"	"	†	----	----	"	"	"	----	199
60	54	30	20	----	‡200	----	----	------	10	60	----	----	yes	"	"	†	yes	yes	"	"	----	----	200

‡ And board. *Permit given by inspectors. † None required.

Inspection book No. 5. **TABLE No. 1.—Continued.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
201	Mar. 20	Detroit	Barbier & Sons	Carriages	run.	part
202	" 20	"	Standard Laundry	Laundry work	"	full
203	" 20	"	A. J. Fiferlik	Clothing	"	part
204	" 20	"	J. C. Bleil	Wagons & carriages	"	full
205	" 23	"	Otto Pett	Clothing	"	"
206	" 23	"	Herman Pett	"	"	part
207	" 23	"	Detroit Laundry	Laundry work	"	"
208	" 23	"	Dobt & Casper	Bread and cake	"	full
209	" 23	"	Snow Flake Laundry	Laundry work	"	part
210	" 24	"	Zacharias & Mason	Shirt waists	"	full
211	" 24	"	Whittikin & Peters Wire & Iron Wk	Wire and iron goods	"	part
212	" 24	"	C. O. Garrison	Cigar boxes	"	full
213	" 24	"	O. A. Turney	Jelly, pickles & vinegar	"	"
214	" 24	"	Delbridge & Cameron Co.	Sash and doors	"	part
215	" 24	"	Detroit Cement & Sewer Pipe Wk.	Crocks and sewer pipe	"	full
216	" 24	"	DeMan Bros.	Sash, doors and blinds	"	"
217	" 25	"	A. Hanssen	Cigars	"	"
218	" 25	"	J. P. Shafer	"	"	"
219	" 25	"	Peninsular Clay Pipe Co.	Clay pipes	idle	......
220	" 25	"	John Thwaites & Co.	Reed chairs	run.	part
221	" 25	"	Index Printing Co.	Job printing	"	full
222	" 26	"	Morton Baking Co.	Bread and buns	"	"
223	" 26	"	J. H. McEldowney	Brooms	"	part
224	" 26	"	L. Crabb & Son	"	"	"
225	" 26	"	Johnson Manufacturing Co.	Mustard and catsup	"	full
226	" 26	"	Griswold Carpet Cleaning W'ks.	Cleaning carpets	"	part
227	" 26	"	Western Carpet Cleaning Works	" "	"	"
228	" 26	"	The H. J. Boerth Pie Baking Co.	Pies	"	full
229	" 27	"	J. L. Morrison & Son	Handles	"	part
230	" 27	"	Symonds Wire & Iron Works	Wire and iron goods	"	"
231	" 27	"	N. H. Faber	Cigars	idle	......
232	" 27	"	Detroit Wire & Iron Works	Iron and wire goods	run.	full
233	" 27	"	John Rattray	Bread and cakes	"	"
234	" 30	"	Detroit Milling Co.	Flour and feed	"	"
235	" 30	"	G. A. Burch	Ladders	"	part
236	" 30	"	C. Metzer	Cigars	"	full
237	" 30	"	Meison & Risk	Wagons and carriages	"	"
238	" 30	"	John J. Marten	Sash, doors and blinds	"	part
239	" 31	"	Michigan Glass Painting Co.	Mottoes and frames	"	"
240	" 31	"	Fox Bros.	Furniture	"	full
241	" 31	"	L. B. DeGalen	Wood turning	"	"
242	" 31	"	George Kieler	Cigars	"	"
243	" 31	"	American Bakery	Bread and cake	"	"
244	" 31	"	J. Walinske	Clothing	"	part
245	" 31	"	Shambleau's Carriage Works	Carriages	"	full
246	April 1	"	M. Johnson	Paper boxes	"	part
247	" 1	"	Damaschke & Spader	Wagons	"	full
248	" 1	"	James Buyers	Carriages	"	"
249	" 1	"	Detroit Basket Co.	Baskets	"	part
250	" 1	"	Peters Bros. Carpet Cleaning Wk	Cleaning carpets	"	"

District No. 1. *Wm. F. Tripp, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	54	8	6	....	$225	....	....	......	10	*30	....	....	yes	yes	no	†	....	....	yes	yes	....	....	201
60	60	6	2	1	80	....	....	......	10	*30	....	....	....	"	"	†	....	....	"	"	yes	....	202
60	54	6	4	2	200	....	....	......	10	60	....	....	....	"	"	†	....	....	"	"	"	....	203
60	60	6	4	....	180	....	....	......	10	60	....	....	yes	"	"	†	....	....	"	"	....	....	204
60	60	10	2	4	150	....	....	......	10	*30	....	....	"	"	"	†	yes	yes	"	"	yes	....	205
60	54	8	2	6	180	....	2	no	10	*30	....	....	....	"	"	†	"	"	"	"	"	....	206
60	54	5	2	2	150	....	....	......	10	60	....	....	yes	"	"	†	"	"	"	"	"	....	207
60	60	5	2	1	100	....	....	......	10	60	....	....	"	"	"	†	....	....	"	"	"	....	208
60	54	6	1	3	90	....	1	yes	10	60	....	....	....	"	"	†	yes	yes	"	"	"	....	209
60	60	100	2	78	1,500	....	....	......	10	*30	yes	....	yes	"	"	yes	"	no	"	"	"	....	210
60	54	10	4	....	150	....	....	......	10	*30	....	....	"	"	"	†	"	yes	"	"	....	....	211
60	60	20	5	4	300	....	1	no	10	45	....	....	"	"	"	†	"	"	"	"	yes	....	212
60	60	8	3	1	110	....	....	......	10	*30	....	....	"	"	"	†	....	....	"	"	"	....	213
60	54	36	12	....	600	....	....	......	10	*30	....	....	"	"	"	†	yes	yes	"	"	....	....	214
60	60	8	6	....	300	....	....	......	10	45	....	....	....	"	"	†	"	"	"	"	....	....	215
60	60	55	32	....	1,550	....	....	......	10	45	....	....	yes	"	"	†	"	"	"	"	....	....	216
48	48	5	3	2	150	....	1	yes	8	60	....	....	....	"	"	†	....	....	"	"	yes	....	217
48	48	5	5	....	240	....	....	......	8	60	....	....	yes	"	"	†	....	....	"	"	....	....	218
60	..	14	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	219
60	54	31	18	....	650	....	....	......	10	*30	....	....	yes	yes	no	†	yes	yes	yes	yes	....	....	220
60	60	5	5	....	225	....	....	......	10	60	....	....	....	"	"	†	"	"	"	"	....	....	221
60	60	50	24	1	1,125	....	....	......	10	60	....	yes	yes	"	"	†	"	"	"	"	yes	....	222
60	54	6	4	....	120	....	....	......	10	60	....	....	"	"	"	†	"	"	"	"	....	....	223
60	54	15	12	3	525	....	....	......	10	60	....	....	"	"	"	†	"	"	"	"	yes	....	224
60	60	6	5	....	200	....	....	....	10	60	....	....	"	"	"	†	"	"	"	"	....	....	225
60	48	6	3	...	120	....	....	......	10	60	...	....	"	"	"	†	"	"	"	"	....	....	226
60	54	5	2	1	120	....	....	......	10	60	....	....	....	"	"	†	"	"	"	"	yes	....	227
60	60	10	6	....	280	....	....	......	10	60	....	....	yes	"	"	†	....	....	"	"	....	....	228
60	30	6	4	....	150	....	....	......	10	60	....	....	....	"	"	†	yes	yes	"	"	....	....	229
60	48	15	8	....	300	....	....	......	10	45	....	....	yes	"	"	†	"	"	"	"	....	....	230
48	..	6	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	231
60	60	16	11	....	250	1	6	no	10	60	...	....	yes	yes	no	†	....	....	yes	yes	....	....	232
60	60	4	3	1	95	....	....	......	10	60	....	....	....	"	"	†	....	...	"	"	yes	....	233
60	60	4	4	....	150	....	....	......	10	60	....	....	no	"	"	yes	yes	yes	"	"	....	....	234
60	48	5	3	....	90	....	....	......	10	*30	....	....	yes	"	"	†	"	"	"	"	....	....	235
48	48	8	4	....	160	....	....	......	8	60	....	....	....	"	"	†	....	....	"	"	....	....	236
60	60	5	4	....	150	....	....	......	10	60	....	....	yes	"	"	†	....	....	"	"	...	...	237
60	54	20	10	....	370	....	....	......	10	*30	....	....	"	"	"	†	yes	yes	"	"	....	....	238
57	54	20	3	12	225	....	....	......	9	60	....	....	"	"	"	†	....	....	"	"	yes	....	239
54	54	12	6	....	300	....	....	......	9	60	....	....	"	"	"	†	yes	yes	"	"	....	....	240
60	60	6	4	....	150	....	....	......	10	60	....	....	"	"	"	†	"	"	"	"	....	....	241
48	48	8	2	....	90	....	....	......	8	60	....	....	...	"	"	†	....	....	"	"	...	..	242
60	60	6	6	....	250	....	....	......	10	60	....	....	yes	"	"	†	....	....	"	"	....	....	243
60	54	6	2	2	130	....	....	......	10	60	....	....	....	"	"	†	yes	yes	"	"	yes	....	244
60	60	6	4	....	* 150	....	....	......	10	45	...	....	yes	"	"	†	....	....	"	"	....	....	245
54	42	25	4	11	280	....	5	no	10	60	....	....	"	"	"	†	yes	yes	"	"	yes	....	246
60	60	6	4	....	150	....	....	......	10	*30	....	....	"	"	"	†	....	....	"	"	....	....	247
60	60	6	5	....	175	....	....	......	10	60	...	....	"	"	"	†	....	....	"	"	....	....	248
60	54	6	4	....	130	....	....	......	10	60	....	....	"	"	"	†	yes	yes	"	"	....	....	249
60	48	6	4	....	150	....	....	......	10	60	....	....	"	"	"	†	"	"	"	"	....	....	250

*** Permit given by inspector. † None required.**

Inspection book No. 6. **TABLE No. 1.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running is it full or part time?
251	Apr.	2	Detroit	Victor Manufacturing Co.	Cash registers	run.	full
252	"	2	"	Detroit Vapor Stove Co.	Vapor stoves	"	"
253	"	2	"	Phœnix Wire Works, No. 1	Iron and wire goods	"	part
254	"	2	"	D. H. Brown	Baskets	"	"
255	"	2	"	P. Gerharz	Cigars	"	full
256	"	3	"	Novelty Knitting Mills Co.	Knit goods	"	part
257	"	3	"	Anderson Safety Elevator Co.	Elevators	"	full
258	"	3	"	Peninsular Manufacturing Co.	Buffing composition	"	"
259	"	3	"	The Bowling Fiber Garment Co.	Fiber cloth	"	part
260	"	6	"	L. C. Brossy Dyeing Co.	Dyed goods	"	full
261	"	6	"	Model Laundry	Laundry work	"	"
262	"	6	"	Detroit Emery Wheel Co.	Emery wheels	"	"
263	"	6	"	Detroit Boat Works	Yachts and row boats	"	"
264	"	7	"	Detroit Citizen's Street R'y Co.	Street cars	"	"
265	"	7	"	Pearl Laundry	Laundry work	"	part
266	"	7	"	Union Iron Co.	Pig iron	"	full
267	"	7	"	Peninsular Iron Co.	" "	idle	......
268	"	8	"	Michigan Gas Co.	Gas	run.	full
269	"	8	"	Detroit Iron Furnace Co.	Pig iron	idle	......
270	"	8	"	Michigan Ammonia Works	Ammonia	run.	full
271	"	8	"	Gaylord Iron Co.	Pig iron	"	"
272	"	8	"	Michigan Bolt and Nut Works	Bolts and nuts	"	part
273	"	8	"	B. Korte	Carriages and trucks	"	full
274	"	9	"	The Ireland & Mathews M'f'g Co.	Stove trimmings, etc.	"	"
275	"	10	"	Detroit Edge Tool Works	Machine knives	"	"
276	"	10	"	Detroit Twist Drill Co.	Drills and chucks	"	"
277	"	10	"	Currie & Conn	Cedar blocks	idle	......
278	"	10	"	J. W. Engel	Cigars	run.	full
279	"	10	"	F. X. Rousseau	Tackle blocks	"	part
280	"	13	"	Detroit Heating & Lighting Co.	Gas machines	"	full
281	"	13	"	Leonard Laurense & Co.	Mouldings and frames	"	"
282	"	14	"	Berry Brothers	Varnishes	"	"
283	"	14	"	Acme Safety Emery Wheel Co.	Emery wheels	idle	......
284	"	14	"	Peninsular Lead & Color W'ks	Paints	run.	full
285	"	15	"	Detroit Linseed Oil Works	Linseed oil	"	"
286	"	15	"	Detroit Wooden Ware Works	Boxes, pails and tubs	"	"
287	"	15	"	Detroit Oak Belting Co.	Leather belts	"	"
288	"	16	"	Wm. Ellis	Clean and dry grain	"	part
289	"	16	"	W. A. C. Miller	Lumber	"	full
290	"	16	"	Murphy Iron Works	Smokeless fur. & mach.	"	"
291	"	17	"	Wolverine Stone Co.	Stone	"	"
292	"	17	"	Michigan Optical Co.	Optical goods	"	"
293	"	17	"	Central Laundry	Laundry work	"	part
294	"	17	"	A. W. Reckmeyer & Co.	Furs	"	full
295	"	17	"	Barney Nehls	Electroplated goods	"	"
296	"	17	"	John O'Dwyer	Clay pipes	"	part
297	"	20	"	Parke, Davis & Co.	Pharmaceutical suppl's	"	full
298	"	20	"	Byram & Co.	Foundry sup. & cupolas.	"	"
299	"	21	"	Detroit Stove Works	Stoves and ranges	"	"
300	"	23	"	U. S. Capsule Co.	Capsules	"	"

District No. 1. *W. F. Tripp, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	30	24	2	$900	....	4	no	10	*30	yes	no	yes	yes	no	yes	yes	yes	no	yes	yes	....	251
60	60	12	10	....	325	....	....	......	10	*30	"	"	"	"	"	"	"	"	yes	"	....	....	252
60	54	40	35	....	1,300	....	....	......	10	*30	"	"	"	"	"	"	"	"	"	"	....	....	253
60	54	6	3	....	105	....	....	......	10	60	--	....	....	"	"	†	....	....	"	"	....	....	254
48	48	6	3	....	120	....	....	......	8	60	...	....	....	"	"	†	....	....	"	"	....	....	255
57	53	75	6	34	700	....	4	yes	9½	*30	yes	no	yes	no	"	yes	yes	yes	"	"	yes	....	256
60	60	20	6	....	300	....	....	......	10	*30	"	"	"	yes	"	"	"	"	"	"	....	....	257
60	60	8	4	....	200	....	....	......	10	*30	"	"	"	no	"	"	"	"	"	"	....	....	258
60	48	20	8	....	325	....	....	......	10	*30	"	"	"	"	"	†	"	"	"	"	....	....	259
60	60	28	12	10	700	....	....	......	10	*30	"	"	"	yes	"	†	"	"	"	"	yes	....	260
60	60	10	5	5	250	....	....	......	10	60	....	....	"	"	"	†	"	"	"	"	"	....	261
60	60	70	58	2	2,500	....	....	......	10	*30	yes	yes	"	"	"	†	"	"	"	"	"	....	262
60	60	30	24	1	1,000	....	....	......	10	*30	....	....	"	"	"	†	"	"	"	"	"	....	263
60	60	100	100	....	3,100	....	....	......	10	*30	....	....	"	"	"	†	"	"	"	"	....	....	264
60	54	6	1	2	80	....	....	......	10	60	....	no	"	"	"	†	‡	....	"	"	yes	....	265
72	72	30	30	....	1,100	....	....	......	10	*30	yes	yes	"	"	"	yes	yes	yes	"	"	....	....	266
72	..	30	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	267
72	72	20	12	....	450	...	....	......	10	60	....	....	yes	yes	no	†	yes	yes	yes	yes	....	....	268
60	..	30	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	269
60	60	12	13	....	500	....	....	......	10	*30	....	....	yes	yes	no	†	yes	yes	yes	yes	....	....	270
72	72	30	30	....	1,000	....	....	......	10	*30	....	yes	"	"	"	yes	"	"	"	"	....	....	271
60	57	200	124	1	4,400	....	12	yes	10	*30	....	"	no	"	"	†	"	no	"	"	yes	....	272
60	60	8	4	..	150	....	....	......	10	60	yes	....	yes	"	"	†	"	yes	"	"	....	....	273
60	60	275	230	30	9,200	1	8	no	10	50	"	yes	"	"	"	yes	"	no	no	"	yes	....	274
60	60	24	16	....	300	....	....	......	10	*30	....	....	"	"	"	†	"	yes	yes	"	....	....	275
60	60	55	28	2	1,050	....	....	......	10	45	....	....	"	"	"	†	"	"	"	"	yes	1	276
60	..	30	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	277
48	48	5	3	....	110	....	....	......	8	60	....	....	yes	yes	no	†	....	....	yes	yes	....	....	278
60	54	15	5	....	225	....	....	......	10	*30	....	....	"	"	"	†	yes	yes	"	"	....	....	279
60	60	50	47	3	1,500	....	....	......	10	*30	yes	no	"	"	"	†	"	"	"	"	yes	....	280
60	60	100	62	13	2,800	....	12	no	10	*30	....	....	"	"	"	†	"	"	"	"	"	....	281
60	60	80	70	10	3,000	....	....	......	10	*30	yes	no	"	"	"	yes	"	"	"	"	"	....	282
60	..	12	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	283
60	60	60	20	5	1,400	....	....	......	10	45	yes	no	yes	yes	no	yes	yes	yes	yes	yes	yes	....	284
60	60	20	5	....	250	....	....	......	10	45	....	....	"	"	"	†	"	"	"	"	....	....	285
60	60	250	175	....	4,800	1	10	no	10	*30	....	....	"	"	"	yes	"	"	"	"	....	....	286
60	60	100	64	1	3,000	....	....	......	10	*30	....	no	"	"	"	†	"	"	"	"	yes	....	287
60	48	12	10	....	300	....	....	......	10	*30	....	....	....	"	"	†	"	"	"	"	....	....	288
60	60	50	20	....	750	....	....	......	10	*30	....	....	....	"	"	†	"	"	"	"	....	....	289
60	60	100	60	1	4,000	....	....	......	10	*30	....	no	yes	"	"	†	"	"	"	"	yes	1	290
60	60	12	5	....	250	....	....	......	10	*30	....	....	....	"	"	†	....	....	"	"	....	....	291
60	60	71	39	21	1,370	....	20	no	10	*30	yes	....	yes	"	"	yes	yes	yes	"	"	yes	....	292
60	54	6	2	4	160	....	....	......	10	60	....	....	"	"	"	†	"	"	"	no	"	....	293
48	48	24	10	12	750	....	....	......	8	*30	....	....	"	"	"	†	"	"	"	yes	"	....	294
60	60	12	12	....	575	....	1	yes	10	*30	....	....	"	"	"	†	"	"	no	"	....	....	295
60	48	12	3	1	110	....	....	......	10	*30	....	....	"	"	"	†	....	....	yes	"	yes	....	296
57	57	1200	700	500	8,900	....	2	yes	10	60	....	yes	"	"	"	yes	yes	yes	"	"	"	....	297
60	60	50	12	1	500	....	....	......	10	*30	....	no	"	"	"	"	"	"	"	"	"	....	298
60	60	1000	888	3	36,400	2	33	§	10	*30	yes	yes	"	"	"	"	"	"	"	"	"	....	299
57	57	200	24	96	2,500	....	4	no	9½	60	....	no	"	"	"	"	"	"	"	"	"	....	300

* Permit given by inspector. † None required.
§ Not all. ‡ Hand machinery.

Inspection book No. 7. **TABLE No. 1.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
301	Apr.	23	Detroit	St. Clair Paper Manufact'ing Co.	Paper	run.	full
302	"	23	"	Globe Iron Works	Dynamos and castings	"	"
303	"	24	"	Frontier Iron Works	Engines and castings	"	"
304	"	24	"	Delta Lumber Co.	Lumber and timber	"	"
305	"	24	"	McClure, Kelsey & Co.	Hose trucks	"	"
306	"	24	"	Walter H. Oades & Co.	Repair and build boats	"	"
307	"	27	"	Wm. F. Myll	Dressed lumber	"	"
308	"	27	"	U. S. Frumentum Co.	Frumentum	"	"
309	"	27	"	R. McKinzie & Sons	Shipsmiths' goods	"	"
310	"	27	"	Fred Kahl Foundry	Castings	"	"
311	"	27	"	Detroit Planing Mill	Lumber	"	part
312	"	28	"	American Brass & Metal Works.	Brass and metal goods	"	full
313	"	28	"	Cartwright Bros.	Cut stone	idle	......
314	"	28	"	Lauhoff Roller Mill Works	Machinery	run.	full
315	"	28	"	Lauhoff Tobacco Works	Tobacco	"	part
316	"	29	"	Michigan Stove Co.	Stoves and ranges	"	"
317	"	30	"	Ideal Manufacturing Co.	Sanitary and toy goods.	"	full
318	"	30	"	H. C. Hart Manufacturing Co.	Brass goods	"	"
319	"	30	"	Excelsior Stove Pattern Co.	Stove patterns	"	"
320	May	1	"	Ideal Boiler Co.	Hot water & steam boil's	"	"
321	"	1	"	Rich & Co.	Lamps and gas fixtures	"	"
322	"	1	"	Crescent Brass & Iron Works	Ornamental & iron goods	"	"
323	"	1	"	East End Boiler Works	Boilers	"	"
324	"	1	"	Independent Cigar Co.	Cigars	"	"
325	"	4	"	Detroit Dry Dock Co.	Wooden steam ships	"	"
326	"	4	"	Dry Dock Engine Works	Marine engines	"	"
327	"	4	"	Detroit Dry Dock Boiler Works	Boilers	"	"
328	"	5	"	D. G. H. & M. Machine Shop	Locomotives	"	"
329	"	5	"	D. G. H. & M. Car Shops	Railroad cars	"	"
330	"	5	"	Detroit Sheet Metal & Brass W'ks	Brass and metal goods	"	part
331	"	4	"	Detroit Plating Works	Bronze and plating	"	full
332	"	6	"	Detroit Screw Works	Machine screws	"	"
333	"	6	"	W. H. Granger	Pumps	"	part
334	"	6	"	C. H. Little	Lime and stone	"	full
335	"	6	"	R. Robertson & Co.	Cut stone	"	"
336	"	6	"	Shulte & Bros.	Soap	"	"
337	"	7	"	Detroit Railroad Elevator Co.	Grain	"	"
338	"	7	"	D. E. Rice	Machinery	"	"
339	"	8	"	McGregor's Boiler Works	Boilers	"	part
340	"	8	"	Vinton & Co.	Buildings	"	full
341	"	8	"	H. S. Green & Co.	Chip potatoes	"	"
342	"	11	"	Detroit Railway Co. Power House	Electric power	"	"
343	"	11	"	Detroit Citizens' St. Railway Co.	" "	"	"
344	"	11	"	Samuel F. Hodge & Co.	Castings & marine engi's	"	"
345	"	12	"	Sievers & Erdman	Carriages	"	"
346	"	12	"	American Laundry	Laundry work	"	"
347	"	12	"	G. R. Gross & Son	Cigars	"	"
348	"	12	"	Fulton Iron & Engine Works	Engines and elevators	"	"
349	"	13	"	Detroit Publishing Co.	Printed matter	"	"
350	"	13	"	Raynor & Taylor	" "	"	"

District No. 1. ***Wm. F. Tripp, Deputy Inspector.***

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water-closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
72	72	20	20	....	$800	....	....	......	10	†30	no	no	yes	yes	no	yes	yes	yes	yes	yes	....	....	301
60	60	80	50	....	1,850	....	1	no	10	†30	....	....	"	"	"	‡	"	"	"	"	....	....	302
60	60	130	130	....	5,000	....	....	......	10	†30	yes	....	"	"	"	yes	"	"	"	"	....	....	303
60	60	110	110	....	4,800	....	....	......	10	45	....	....	"	"	"	"	"	"	"	"	....	....	304
57	57	18	8	....	250	....	1	yes	10	†30	....	....	"	"	"	‡	"	"	"	"	....	....	305
60	60	50	24	....	1,200	....	....	......	10	†30	....	....	....	"	"	‡	"	"	"	"	....	....	306
60	60	10	10	....	340	....	....	......	10	45	....	....	yes	"	"	yes	"	"	"	"	....	....	307
60	60	10	10	....	500	....	....	......	10	†30	....	no	"	"	"	"	"	"	"	"	....	....	308
60	60	7	5	....	200	....	....	......	10	45	....	....	"	"	"	‡	"	"	"	"	....	....	309
60	60	35	32	....	1,415	....	1	yes	10	†30	....	no	"	"	"	‡	"	"	"	"	....	....	310
60	48	5	5	....	180	....	....	......	10	†30	....	....	....	"	"	‡	"	"	"	"	....	....	311
60	60	150	75	....	2,800	....	1	yes	10	45	....	....	yes	"	"	‡	"	"	no	"	....	....	312
54	..	14	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	313
60	60	6	6	....	300	....	....	......	10	†30	....	....	....	yes	no	‡	yes	yes	yes	yes	....	....	314
60	54	20	10	4	350	....	....	......	10	†30	..	....	yes	"	"	‡	"	"	"	"	yes	....	315
60	57	1000	800	2	40,000	....	8	no	10	†30	yes	no	"	"	"	yes	"	"	"	"	"	3	316
60	60	300	218	22	8,000	....	18	yes	10	†30	"	"	"	"	"	"	"	"	"	"	"	1	317
60	60	140	23	2	900	....	....	......	10	†30	....	"	"	"	"	"	"	"	"	"	"	....	318
60	60	65	30	1	1,350	....	....	......	10	†30	....	"	"	"	"	"	"	"	"	"	"	....	319
60	60	50	30	....	1,700	....	....	......	10	†30	....	....	"	"	"	‡	"	"	"	"	....	....	320
60	60	10	10	....	500	....	....	......	10	†30	....	no	"	"	"	yes	"	"	"	"	....	....	321
60	60	100	86	14	3,700	....	6	yes	10	†30	....	"	"	"	"	"	"	"	"	"	yes	....	322
60	60	35	15	....	800	....	....	......	10	60	....	....	....	"	"	‡	"	"	"	"	....	....	323
48	48	7	4	2	180	....	1	no	8	60	....	....	....	"	"	‡	....	....	"	"	yes	....	324
60	60	277	130	....	4,900	....	....	......	10	45	....	....	yes	"	"	‡	yes	yes	"	"	....	1	325
60	60	125	125	....	6,000	....	....	......	10	45	....	....	"	"	"	yes	"	"	"	"	....	....	326
60	60	140	60	....	2,800	....	....	......	10	45	....	....	....	"	"	‡	"	"	"	"	....	....	327
60	60	200	135	....	5,100	....	....	......	10	60	yes	....	yes	"	"	yes	"	"	"	"	....	....	328
60	60	50	40	....	1,500	....	....	......	10	60	....	....	"	"	"	‡	"	"	"	"	....	....	329
60	*	325	175	3	5,700	....	....	......	10	60	yes	no	"	"	"	yes	"	"	"	"	yes	....	330
60	60	25	15	3	700	....	....	......	10	†30	....	yes	"	"	"	"	"	"	no	"	"	....	331
60	60	200	206	2	7,000	....	16	§	10	†40	....	no	"	"	"	"	"	"	yes	"	"	6	332
60	30	10	3	....	100	....	....	......	10	60	....	....	"	"	"	‡	"	"	"	"	....	....	333
60	60	25	25	....	750	....	....	......	10	†30	....	....	"	"	"	‡	"	"	"	"	....	1	334
54	54	20	20	....	950	....	....	......	9	60	....	....	....	"	"	‡	"	"	"	"	....	....	335
60	60	6	6	....	250	....	....	......	10	60	yes	....	yes	"	"	‡	"	"	"	"	....	....	336
60	60	25	10	....	550	....	....	......	10	60	"	....	"	"	"	yes	"	"	"	"	....	....	337
60	60	16	8	....	350	....	....	......	10	†30	....	....	"	"	"	‡	"	"	"	"	....	....	338
60	30	20	5	....	250	....	....	......	10	†30	....	....	"	"	"	‡	"	"	"	"	....	....	339
54	54	240	200	....	8,700	....	....	......	9	†30	yes	....	"	"	"	‡	"	"	"	"	....	....	340
60	60	10	8	2	300	....	....	......	10	60	....	....	"	"	"	‡	....	....	"	"	no	....	341
48	48	22	22	....	1,200	....	....	......	10	60	....	....	"	"	"	‡	yes	yes	"	"	....	....	342
72	72	15	15	....	900	....	....	......	10	60	....	....	"	"	"	‡	"	"	"	"	....	....	343
60	60	130	130	....	6,300	....	....	......	10	†30	yes	....	"	"	"	yes	"	"	"	"	....	....	344
60	60	80	65	....	3,500	....	....	......	10	†30	"	no	"	"	"	"	"	"	"	"	....	....	345
54	54	18	3	5	230	....	1	yes	10	60	....	....	"	"	"	‡	"	"	"	"	yes	....	346
48	48	60	5	27	900	....	2	no	8	60	....	....	"	"	"	‡	....	....	"	"	"	....	347
60	60	120	70	....	3,300	....	....	......	10	†30	yes	yes	"	"	"	yes	yes	yes	"	"	....	....	348
60	60	12	7	....	280	....	....	......	10	60	....	....	"	"	"	‡	"	"	"	"	....	....	349
54	54	50	30	6	1,650	....	....	......	9	60	....	....	"	"	"	yes	"	"	"	"	yes	....	350

*** 54 and 60.** **† Permit given by inspector.** **‡ None required.**
§ Not all.

Inspection book No. 8. TABLE No. 1.—Continued.—

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
351	May 13	Detroit	H. Dietz	Cigars	run.	full
352	" 13	"	Northwest Cigar Mf'g Co.	"	"	"
353	" 13	"	E. G. Miles & Co.	Horse goods	"	"
354	" 13	"	H. M. Kittle & Co.	Trunks and bags	"	"
355	" 14	"	Tuttle & Clark	Harness and turf goods	"	"
356	" 14	"	Detroit Cap Mf'g Co.	Caps	"	"
357	" 14	"	Detroit Horse Goods Co.	Horse goods	"	"
358	" 14	"	Christiansen Harness Mf'g Co.	Harness and horse g'ds.	"	"
359	" 14	"	Detroit Picture Frame Factory	Mouldings and frames.	"	"
360	" 14	"	Pierson & Hough	Harness and horse g'ds.	"	"
361	" 15	"	Clark & Reardon	Printed matter	"	"
362	" 15	"	Beck & Knight	Book binding	"	"
363	" 15	"	H. Hanshaw	Signs	"	"
364	" 18	"	John A. Schwegler	Jewelry	"	"
365	" 18	"	J. Berlin	Hats and caps	"	"
366	" 18	"	Wm. Partridge	Book binding	"	"
367	" 18	"	H. E. Downer	Engravings and stencils	"	"
368	" 18	"	The Angelus Printing Co.	Job printing	"	"
369	" 18	"	Chas. Macnair & Co.	Book binding	"	part
370	" 19	"	Van Leyen & Hensler	Engraving	"	full
371	" 19	"	W. Tegge	Cigars	"	"
372	" 19	"	Maddock Glove Co.	Gloves and mittens	"	"
373	" 19	"	Imperial Cap Mf'g Co.	Caps	"	"
374	" 19	"	Ockford Printing Co.	Job printing	"	"
375	" 20	"	Heavenrich Bros.	Clothing	"	"
376	" 20	"	Sanger's Steam Laundry	Laundry work	"	part
377	" 20	"	J. W. Morrison & Co.	Job printing	"	full
378	" 20	"	Chas. E. Wain & Co.	Machinery	"	"
379	" 20	"	Detroit Popcorn Novelty Co.	Popcorn	"	"
380	" 21	"	Rothschild & Bro.	Strip tobacco	"	"
381	" 21	"	Thorp, Hawley & Co.	Candy	"	"
382	" 21	"	Henry Hahn	Baked goods	"	"
383	" 21	"	The Steese C'tr, St'l & Iron W'ks	C'tr, stools & iron goods	"	"
384	" 21	"	Jefferson Press	Book and job printing	"	"
385	" 21	"	Ryan Bros. Knitting Co.	Knit goods	"	"
386	" 22	"	Valentine Schroeder, No. 2	Pepsin gum	"	"
387	" 22	"	J. A. Topping	Job printing	"	"
388	" 22	"	American Brush Co.	Brushes and woodw're.	"	"
389	" 23	"	Voelkner & Reinke Mf'g Co.	Wood & metal patterns.	"	"
390	" 23	"	The Architec. Iron & Wire W'ks	Wire and iron goods	"	"
391	" 23	"	W. H. Hill & Co.	Drugs	"	"
392	" 23	"	J. Blenkle & Co.	Carriages	"	"
393	" 23	"	Albert Rohns & Co.	Iron goods	"	"
394	" 23	"	Jacob Burnstine, No. 2	Rags	"	"
395	" 25	"	Detroit Stamping Co.	Tin goods, etc.	"	part
396	" 25	"	Union Printing Co.	Job printing	"	full
397	" 25	"	Cut Rate Carpet Cleaning W'ks.	Cleaning carpets	"	"
398	" 25	"	Gem Paper Package Co.	Paper packages	"	"
399	" 25	"	Daly Stamping Mf'g Co.	Joists and hangers	"	"
400	" 26	"	Hitchcook, Van Liew & Co.	Mustard, etc.	"	"

District No. 1. *Wm. F. Tripp, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
48	48	25	4	14	$700	----	3	yes	8	60	----	----	yes	yes	no	†	----	----	yes	yes	yes	----	351
48	48	7	5	1	225	----	----	------	8	60	----	----	----	"	"	†	----	----	"	"	"	----	352
60	60	25	7	----	350	----	----	------	10	*30	----	----	yes	"	"	yes	----	----	"	"	----	----	353
60	60	40	10	----	200	----	----	------	10	60	----	no	"	"	"	"	yes	yes	"	"	----	----	354
60	60	25	16	----	700	----	----	------	10	*30	----	"	"	"	"	"	----	----	"	"	----	----	355
57	57	50	14	10	650	----	1	yes	9½	60	----	"	"	"	"	"	yes	yes	"	"	yes	----	356
60	60	25	15	1	650	----	1	"	10	60	----	"	"	"	"	"	----	----	"	"	"	----	357
60	60	12	7	----	350	----	----	------	10	*30	----	"	"	"	"	†	----	----	"	"	----	----	358
60	60	7	5	----	195	----	----	------	10	*30	----	"	"	"	"	yes	----	----	"	"	----	----	359
60	60	45	38	10	1,300	----	----	------	10	*30	----	"	"	"	"	"	yes	yes	"	"	yes	----	360
54	54	12	7	----	250	----	1	yes	9	60	----	----	"	"	"	†	"	"	"	no	----	----	361
54	54	14	4	3	225	----	----	------	9	60	----	----	"	"	"	yes	"	"	"	yes	no	----	362
60	60	10	5	1	240	----	----	------	10	*30	----	----	"	"	"	"	----	----	"	"	yes	----	363
54	54	7	5	----	225	----	----	------	9	60	----	----	"	"	"	"	yes	yes	"	"	----	----	364
60	60	40	16	14	700	----	----	------	10	*30	----	yes	"	"	"	no	"	"	"	"	yes	----	365
60	60	6	3	1	220	----	----	------	10	60	----	----	"	"	"	yes	"	"	"	"	"	----	366
54	54	10	5	----	250	----	----	------	9	60	----	----	"	"	"	"	"	"	"	"	----	----	367
54	54	6	4	2	200	----	----	------	9	60	----	----	"	"	"	"	"	"	"	"	yes	----	368
60	54	7	3	----	100	----	----	------	10	60	----	----	"	"	"	"	"	"	"	"	----	----	369
60	60	12	9	1	400	----	----	------	10	60	----	----	"	"	"	"	"	"	"	"	yes	----	370
48	48	38	4	16	550	----	2	no	8	60	----	----	"	"	"	†	----	----	"	"	"	----	371
60	60	30	8	10	550	----	----	------	10	60	----	no	"	"	"	yes	yes	yes	"	"	no	----	372
60	60	30	8	6	450	1	1	no	10	60	----	"	"	"	"	"	"	"	"	"	"	----	373
60	60	12	5	4	300	----	----	------	10	60	----	"	no	"	"	"	"	"	"	"	yes	----	374
60	60	50	16	----	675	----	----	------	10	60	----	yes	yes	"	"	"	"	"	"	"	----	----	375
60	54	18	4	11	375	----	----	------	10	*30	----	----	"	"	"	†	"	"	"	"	yes	----	376
54	54	14	14	----	550	----	----	------	9	60	yes	----	"	"	"	yes	"	"	"	"	----	----	377
60	60	6	4	----	120	----	----	------	10	*30	----	----	"	"	"	†	"	"	"	"	----	----	378
60	60	10	4	2	200	----	----	------	10	60	----	----	"	"	"	†	----	----	"	"	yes	----	379
54	54	80	5	2	200	----	2	yes	9	60	----	yes	"	"	"	yes	----	----	"	"	"	----	380
60	60	110	42	84	2,600	----	----	------	10	*30	yes	no	"	"	"	"	yes	yes	"	"	"	----	381
54	54	7	4	3	275	----	----	------	9	60	----	----	"	"	"	†	----	----	"	"	"	----	382
60	60	12	6	----	200	----	1	yes	10	*30	----	----	"	"	"	†	yes	yes	"	"	----	----	383
57	57	30	14	4	700	----	----	------	9	60	----	yes	"	"	"	yes	"	"	"	"	yes	----	384
54	54	40	4	25	500	----	3	no	9	*30	----	"	"	"	"	"	"	"	"	"	"	----	385
54	54	50	4	28	700	----	4	yes	9	*30	----	"	"	"	"	†	"	no	"	"	"	1	386
54	54	7	5	----	225	----	----	------	9	60	----	"	"	"	"	yes	"	yes	"	"	----	----	387
60	60	65	45	----	800	1	5	no	10	*30	----	no	"	"	"	"	"	"	"	"	----	----	388
60	60	30	19	1	500	----	3	yes	10	*30	----	----	"	"	"	†	"	"	"	"	yes	----	389
60	60	40	20	1	600	----	----	------	10	*30	----	----	"	"	"	†	"	"	"	"	"	----	390
60	60	12	4	6	300	----	----	------	10	60	----	----	no	"	"	†	"	"	"	"	"	----	391
60	60	10	10	----	325	----	----	------	10	*30	----	----	yes	"	"	†	----	----	"	"	----	----	392
60	60	12	7	----	300	----	----	------	10	*30	----	----	"	"	"	†	yes	yes	"	"	----	----	393
54	54	20	8	17	400	----	----	------	9	*30	----	no	"	"	"	yes	----	----	"	"	yes	----	394
60	48	40	4	----	150	----	----	------	10	*30	----	yes	"	"	"	"	yes	yes	"	"	----	----	395
54	54	20	9	1	300	----	----	------	9	60	----	"	"	"	"	"	"	"	"	"	yes	----	396
60	60	10	4	1	175	----	----	------	10	60	----	"	"	"	"	"	"	"	"	"	"	----	397
60	60	20	3	----	150	----	----	------	10	*30	----	"	"	"	"	"	"	"	"	"	----	----	398
60	60	10	3	----	180	----	----	------	10	*30	----	----	----	"	"	†	"	"	"	"	----	----	399
60	60	10	6	2	300	----	----	------	10	*30	----	no	yes	"	"	no	"	"	"	"	yes	----	400

*Permit given by inspector. † None required.

Inspection book No. 9.

TABLE No. 9.—CONTINUED.—

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
401	May 26	Detroit	Michigan Paste Mf'g Co.	Paste	run.	full
402	" 26	"	The Goodwin Co.	Molders' tools	"	"
403	" 26	"	Hampton & Buyers	Carriages	"	"
404	June 3	"	H. A. Newland & Co.	Furs & cloth garments.	"	part
405	" 3	"	Walter Buhl & Co.	Furs	"	full
406	" 3	"	Armstrong & Graham	Harness and collars	"	"
407	" 3	"	F. W. Zimmerman	Wagons and trucks	"	"
408	" 3	"	Detroit Steam Cloth Spong. Wk.	Spong. & shrinking cloth	"	part
409	" 4	"	William Wain	Machinery	"	full
410	" 4	"	Detroit Sanitary Supply Co.	Sanitary goods	"	"
411	" 4	"	J. J. Guyette & Co.	Pop, etc.	"	"
412	" 4	"	Hygeia Filter Co.	Water filters	"	"
413	" 4	"	Horton-Cato Mf'g Co.	Catsup and table sauces	"	"
414	" 5	"	Detroit Umbrella Co.	Umbrellas and parasols	"	"
415	" 5	"	Stanton & Morey	Men's clothing	"	"
416	" 5	"	Pt. Huron Fiber Gar. Mf'g Co.	Fiber cloth	"	"
417	" 5	"	Mitchell Bros.	Feed	"	"
418	" 5	"	J. Bischof	Machinery	"	"
419	" 5	"	J. L. Buechner	Plated goods	"	"
420	" 8	"	Detroit Waste Works	Cotton waste	"	"
421	" 8	"	City Coffee & Spice Mills	Coffee and spices	"	"
422	" 8	"	Fisher Electrical Mf'g Co.	Electric machinery	"	"
423	" 8	"	Wheeler Saddle Co.	Bicycle saddles	"	"
424	" 9	"	Central Brass Works	Brass goods	"	"
425	" 9	"	Detroit Marble Works	Marble	"	"
426	" 9	"	Robert Baxter	Brass goods	"	part
427	" 9	"	City Bottling Works	Ginger ale	"	full
428	" 9	"	John D. Mouat	Gas fitting & plumb'g	"	"
429	" 10	"	W. J. Burton & Co.	Cornice and roofing	"	"
430	" 10	"	A. Fisher Carriage Factory	Carriages	"	"
431	" 10	"	James Walker & Son	Plumbers' supplies	"	"
432	" 10	"	Detroit Lead Pipe and Sheet Lead Works.	Plumbers & gas fitters supplies.	"	"
433	" 10	"	Niagara Bottling Works	Bottled beer	"	"
434	" 11	"	Grace Laundry	Laundry work	"	"
435	" 10	"	R. & E. Wuelfing	Machinery	"	"
436	" 11	"	Friesema Bros. Printing Co.	Job printing	"	"
437	" 11	"	Western Paper Box Co.	Paper boxes	"	"
438	" 11	"	Webster & Meathe	Plumbing	"	"
439	" 11	"	C. R. Mueller	Machinery	"	"
440	" 12	"	Tribune Printing Co.	Newspaper	"	"
441	" 12	"	Detroit Evening News	Newspaper	"	"
442	" 12	"	Detroit Free Press Printing Co.	Job printing	"	"
443	" 12	"	Cliff & Higgins	Book binding	"	"
444	" 12	"	Habbin Electrotype & Eng. Co.	Electrotype	"	"
445	" 12	"	Ostler Printing Co.	Job printing	"	"
446	" 15	"	Wolverine Box Co.	Boxes	"	"
447	" 17	"	American Paper Stock Co.	Rags and paper	"	"
448	" 17	"	U. Armstrong & Co.	Buildings	"	part
449	" 16	"	Crawford Laundry	Laundry work	"	full
450	" 17	"	John F. Eby & Co.	Job printing	"	"

District No. 1. ***Wm. F. Tripp, Deputy Inspector.***

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	6	5	1	$225	----	----	------	10	†30	----	----	----	yes	no	‡	yes	yes	yes	yes	yes	----	401
60	60	8	4	----	200	----	----	------	10	†30	----	yes	yes	"	"	‡	"	"	"	"	---	----	402
60	60	12	11	----	400	----	----	------	10	†30	----	----	"	"	"	yes	----	----	"	"	---	----	403
54	48	100	10	10	650	----	----	------	10	60	----	yes	"	"	"	"	yes	yes	"	"	yes	----	404
54	54	50	12	18	900	----	----	------	9	60	----	"	"	"	"	"	"	"	"	"	"	----	405
60	60	120	96	4	4,500	----	----	------	10	60	----	"	"	"	"	"	"	"	"	"	"	----	406
60	60	5	5	----	175	----	----	------	10	†30	----	----	"	"	"	‡	----	----	"	"	----	----	407
60	48	6	5	----	180	----	----	------	10	60	----	yes	"	"	"	‡	yes	yes	"	"	----	----	408
60	60	8	6	----	230	----	----	------	10	†30	----	----	"	"	"	‡	"	"	"	"	----	----	409
60	60	30	25	----	950	----	----	------	10	60	----	no	"	"	"	yes	"	"	"	"	----	----	410
60	60	10	10	----	380	----	2	yes	10	60	----	----	"	"	"	‡	"	"	"	"	----	----	411
60	60	8	5	----	200	----	----	------	10	†30	----	no	"	"	"	‡	"	"	"	"	----	----	412
54	54	40	10	5	500	----	----	------	9	60	----	"	"	"	"	no	"	"	"	"	yes	----	413
54	54	100	25	75	1,750	----	1	yes	9	60	----	yes	"	"	"	yes	"	"	"	"	"	----	414
54	54	375	50	325	8,500	----	----	------	9	†30	----	"	"	"	"	"	"	"	"	"	"	----	415
54	54	50	9	13	850	----	----	------	9	†30	yes	"	"	"	"	"	"	"	"	"	"	----	416
60	60	8	8	----	200	----	----	------	10	60	"	----	"	"	"	‡	"	"	"	"	----	----	417
60	60	6	4	----	150	----	----	------	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	418
60	60	7	7	----	250	----	----	------	10	†30	----	----	yes	"	"	‡	"	"	"	"	----	----	419
60	60	5	5	----	180	----	----	------	10	†30	----	---	no	"	"	‡	"	"	"	"	----	----	420
60	60	6	5	1	250	----	----	------	10	60	yes	----	yes	"	"	yes	"	"	"	"	yes	----	421
60	60	75	45	1	1,800	----	----	------	10	60	----	yes	"	"	"	"	"	"	"	"	"	----	422
54	54	25	15	1	600	----	----	------	9	60	----	no	"	"	"	"	"	"	"	"	"	----	423
60	60	12	10	----	350	----	----	------	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	424
54	54	25	12	----	600	----	----	------	9	60	----	----	yes	"	"	‡	"	"	"	"	----	- --	425
60	54	6	3	----	120	----	----	------	10	60	----	----	"	"	"	‡	"	"	"	"	----	----	426
60	60	28	16	----	700	----	----	------	10	†30	----	----	"	"	"	‡	"	"	"	"	----	----	427
60	60	25	16	----	650	----	----	------	10	†30	----	----	"	"	"	‡	"	"	"	"	----	----	428
54	54	45	21	----	950	----	----	------	9	60	----	no	"	"	"	‡	"	"	"	"	----	----	429
60	60	20	20	----	900	----	----	------	10	†30	----	"	"	"	"	yes	----	----	"	"	----	----	430
60	60	22	22	----	800	----	----	------	10	60	----	"	"	"	"	"	yes	yes	"	"	----	----	431
60	60	18	18	----	650	----	----	------	10	60	----	"	"	"	"	"	"	"	"	"	----	----	432
60	60	4	3	----	100	----	----	------	10	60	----	----	"	"	"	‡	"	"	"	"	----	----	433
54	54	32	7	25	875	2	2	no	9	60	yes	----	"	"	"	‡	"	no	"	"	yes	----	434
60	60	5	5	----	175	----	----	------	10	†30	----	----	----	"	"	‡	"	yes	"	"	----	----	435
54	54	12	10	2	425	----	----	------	9	60	----	no	yes	"	"	yes	"	"	"	"	yes	----	436
54	54	30	6	14	550	----	----	------	9	60	----	"	"	"	"	"	"	"	"	"	"	----	437
60	60	40	20	----	900	----	----	------	10	60	----	"	"	"	"	"	----	----	"	"	---	----	438
60	60	10	5	----	200	----	----	------	10	†30	----	----	"	"	"	‡	yes	yes	"	"	----	----	439
48	48	100	100	----	*6,000	----	----	------	8	60	----	----	"	"	"	‡	"	"	"	"	----	----	440
48	48	120	115	5	8,000	----	----	------	8	60	----	----	"	"	"	‡	"	"	"	"	yes	----	441
54	54	50	38	4	8,300	----	----	------	9	60	----	no	"	"	"	yes	"	"	"	"	"	----	442
54	54	17	9	8	550	----	1	yes	9	60	yes	"	"	"	"	"	"	"	"	"	"	----	443
54	54	9	6	----	250	----	----	------	9	60	----	----	"	"	"	"	"	"	"	"	----	----	444
54	54	6	5	----	200	----	----	------	9	60	yes	----	"	"	"	‡	"	"	"	"	----	----	445
60	60	25	25	----	800	----	----	------	10	45	----	----	----	"	"	‡	"	"	"	"	----	2	446
54	54	25	5	16	500	----	----	------	9	60	----	no	yes	"	"	‡	----	----	"	"	yes	----	447
60	54	47	15	----	550	----	----	------	10	60	----	----	"	"	"	‡	----	----	"	"	----	----	448
54	54	21	6	15	500	----	----	------	9	60	----	----	----	"	"	‡	yes	yes	"	"	yes	----	449
54	54	95	23	5	1,100	----	----	------	9	60	----	no	yes	"	"	‡	"	"	"	"	"	----	450

*** Estimated.** **† Permit given by inspector.** **‡ None required.**

Inspection book No. 10. TABLE No. 1.—CONTINUED.—

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
451	June 17	Detroit	A. S. Fitters	Book and job printing	run.	full
452	" 18	"	The Steel Bath M'f'g. Co.	Bath tubs	"	"
453	" 18	"	Royal Manufacturing Co.	Clean and sort silver	"	"
454	" 18	"	Murdock Valve Co.	Valves and brass goods.	"	"
455	" 18	"	E. Gordon	Doors & window screens	"	"
456	" 18	"	Mich. Upholstering & Furn're Co.	Furniture	"	"
457	" 19	"	Detroit Stay Co.	Dress stays	"	"
458	" 19	"	Kieler Bros.	Job printing	"	"
459	" 19	"	Sam Telmo Cigar M'f'g. Co.	Cigars	"	"
460	" 19	"	Detroit Confec. & Fruit Tablet Co.	Candy	"	"
461	" 19	"	J. E. Marentette	Repair elevators	"	"
462	" 19	"	W. H. McCausland & Son	Buildings	"	"
463	" 22	"	J. N. Smith & Co.	Plating & carriage trim.	"	"
464	" 23	"	Speaker Printing Co.	Job printing	"	"
465	" 22	"	Chas. Wright & Co.	Pharmaceutical goods	"	"
466	" 23	"	Calvert Lithographing Co.	Lithographing	"	"
467	" 22	"	Wm. Suckert & Son	Book binding	"	"
468	" 23	"	American Injector Co.	Injectors & brass goods	"	"
469	" 23	"	Water Lily Kollar & Kuff Co.	Collars and cuffs	"	"
470	" 23	"	Smith, Day & Co.	Chairs and rockers	"	"
471	" 23	"	Champion St'm Carpet Be'g W'ks	Cleaning carpets	"	"
472	" 23	"	Co-operative Foundry Co.	Castings	"	"
473	" 24	"	Beck's Feed Mill	Feed	"	"
474	" 24	"	Jacob Beck & Sons	Breakfast food	"	"
475	" 23	"	Clough & Warren Organ Co.	Organs	"	"
476	" 24	"	Central Boiler Works	Boilers	"	"
477	" 25	"	John F. Wilmot & Co.	Soap	"	"
478	" 25	"	Detroit Casket Co.	Caskets	"	"
479	" 25	"	Detroit Dental M'f'g. Co.	Dental goods	"	"
480	" 25	"	Hugh Johnson & Son	Carriages	"	"
481	" 25	"	Detroit Provident Laundry	Laundry work	"	"
482	" 25	"	Economic Printing Co.	Job printing	"	"
483	" 25	"	Kinne Shirt Co.	Shirts	"	part
484	" 26	"	D. C. Winder	Job printing	"	full
485	" 26	"	G. W. Freeman	Elastic socks	"	"
486	" 26	"	E. M. Fenton	Job printing	"	"
487	" 26	"	American Electric Co.	Electric supplies	"	"
488	" 26	"	F. H. West	Job printing	"	"
489	" 30	"	T. W. Noble	Sails and awnings	"	"
490	" 30	"	J. T. Wing & Co.	Belts and leather	"	"
491	" 30	"	E. N. Lightner & Co.	Perfumes, bak. pow. etc.	"	"
492	July 1	"	J. C. Goss & Co.	Sails, tents and awnings	"	"
493	" 1	"	U. S. Baking Co.—Depew Branch	Cake and crackers	"	"
494	" 1	"	P. F. Collier	Printed matter	"	"
495	" 1	"	Peter Sorensen	Jewelry	"	"
496	" 1	"	Moll & Stock	Clothing	"	"
497	" 2	"	Gourlay Bros.	Shirts	"	"
498	" 2	"	Gourlay Steam Laundry	Laundry work	"	"
499	" 2	"	Morgan, Puhl & Morris	Society goods	"	"
500	" 2	"	Newton Annis	Furs	"	"

District No. 1. *W. F. Tripp, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
54	54	5	8	1	$120	....	....	......	9	60	....	....	yes	yes	no	‡	yes	yes	yes	yes	yes	....	451
60	60	32	31	1	1,200	...	....	......	10	†30	yes	no	"	"	"	yes	"	"	"	"	"	....	452
54	54	50	2	30	650	....	....	......	9	60	"	"	"	"	"	"	....	....	"	"	"	....	453
60	60	20	18	....	650	....	....	......	10	†30	....	"	"	"	"	"	yes	yes	"	"	....	....	454
60	60	10	5	....	190	....	....	......	10	†30	....	....	"	"	"	‡	....	....	"	"	....	....	455
60	60	29	28	1	1,050	....	....	......	10	†30	....	....	"	"	"	‡	....	....	"	"	yes	....	456
54	54	90	5	50	1,400	....	....	......	9	60	....	yes	"	"	"	‡	yes	yes	"	"	"	....	457
54	54	5	4	....	150	....	....	......	9	60	....	....	....	"	"	‡	"	"	"	"	....	....	458
54	54	14	7	7	400	....	1	no	9	60	....	....	yes	"	"	‡	....	....	"	"	no	....	459
60	60	150	40	40	1,500	....	....	......	10	†30	....	no	"	"	"	yes	yes	yes	"	"	yes	....	460
60	60	10	6	....	250	....	....	......	10	†30	....	....	"	"	"	‡	"	"	"	"	....	....	461
54	54	20	5	....	200	....	....	......	9	†30	....	....	"	"	"	‡	....	....	"	"	....	....	462
60	60	45	44	1	1,650	....	....	......	10	†30	....	no	"	"	"	yes	yes	yes	"	"	yes	....	463
54	54	15	15	....	550	....	....	......	9	60	....	"	"	"	"	‡	"	"	"	"	....	....	464
57	57	80	6	18	950	....	....	......	10	60	....	yes	"	"	"	yes	"	"	"	"	yes	....	465
54	54	300	200	60	12,100	....	....	......	10	60	....	no	"	"	"	"	"	"	"	"	"	....	466
54	54	25	12	8	650	....	2	yes	9	60	....	....	"	"	"	"	"	"	"	"	"	....	467
60	60	30	28	1	950	....	4	"	10	†30	....	no	"	"	"	"	"	"	"	"	"	....	468
54	54	30	3	7	250	....	....	......	9	60	....	....	"	"	"	"	....	....	"	"	"	....	469
60	60	40	24	....	650	....	4	no	10	60	no	no	"	"	"	no	yes	yes	"	"	....	....	470
60	60	5	4	....	125	....	....	......	10	60	....	....	"	"	"	‡	"	"	"	"	....	....	471
60	60	20	10	....	350	....	....	......	10	†30	....	....	"	"	"	‡	"	"	"	"	....	....	472
60	60	18	18	....	800	....	....	......	10	60	yes	....	no	"	"	yes	"	"	"	"	....	....	473
60	60	15	6	2	800	....	....	......	10	60	....	....	yes	"	"	"	"	"	"	"	yes	....	474
60	60	200	57	3	2,400	....	....	......	10	†30	....	no	"	"	"	no	"	"	"	"	"	1	475
60	60	32	32	....	1,700	....	....	......	10	†30	....	....	....	"	"	‡	"	"	"	"	....	....	476
60	60	10	4	....	150	....	....	......	10	60	....	no	yes	"	"	‡	"	"	"	"	....	....	477
57	57	55	40	5	1,550	....	....	......	10	†30	....	yes	"	"	"	yes	"	"	"	"	yes	....	478
60	60	6	5	....	200	....	....	......	10	60	....	....	"	"	"	‡	"	"	"	"	....	....	479
60	60	50	21	....	1,000	....	....	......	10	60	....	no	"	"	"	yes	....	....	"	"	....	....	480
54	54	20	3	9	225	....	....	......	9	†30	....	...	"	"	"	‡	....	....	"	"	yes	....	481
54	54	4	2	1	100	....	....	......	9	60	....	....	"	"	"	‡	yes	yes	"	"	"	....	482
60	48	10	3	1	125	....	....	......	10	60	....	....	"	"	"	‡	"	"	"	"	"	....	483
54	54	4	2	1	100	....	....	......	9	60	....	....	"	"	"	yes	"	"	"	"	"	....	484
60	60	4	3	....	110	....	....	......	10	60	....	....	"	"	"	"	"	"	"	"	....	....	485
60	60	4	2	1	100	....	....	......	10	60	....	....	"	"	"	"	"	"	"	"	yes	....	486
60	60	5	5	....	175	....	....	......	10	60	....	....	"	"	"	‡	"	"	"	"	....	....	487
54	54	5	4	....	130	....	....	......	9	60	....	....	"	"	"	yes	"	"	"	"	....	....	488
60	60	16	8	8	500	....	....	......	10	60	....	yes	"	"	"	"	"	"	"	"	yes	....	489
60	60	15	12	....	700	....	....	......	10	60	yes	"	"	"	"	"	"	"	"	"	....	....	490
60	60	30	8	10	450	....	2	yes	10	60	....	"	"	"	"	"	"	"	"	"	yes	....	491
60	60	50	27	18	1,200	....	....	......	10	60	....	no	"	"	"	"	"	"	"	"	"	....	492
57	57	33	16	6	800	....	....	......	10	†30	....	yes	"	"	"	"	"	"	"	"	"	....	493
54	54	12	6	3	300	....	....	......	9	60	....	no	"	"	"	"	....	....	"	"	"	....	494
54	54	6	3	....	120	....	....	......	9	60	....	"	"	"	"	"	yes	yes	"	"	....	....	495
54	54	10	5	1	800	....	....	......	9	60	....	"	"	"	"	"	....	....	"	"	yes	....	496
54	54	20	6	12	550	....	....	......	9	60	....	"	"	"	"	"	yes	yes	"	"	"	....	497
54	54	10	....	10	200	....	....	......	9	60	....	"	"	"	"	"	"	"	"	"	"	....	498
54	54	30	10	20	950	....	....	......	9	60	....	yes	"	"	"	"	"	"	"	"	"	....	499
54	54	200	10	15	800	....	1	yes	9	60	....	"	"	"	"	"	"	"	"	"	"	....	500

† Permit given by inspector. ‡ None required.

Inspection book No. 11. **TABLE No. 1.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
501	July	2	Detroit	Smith, Sturgeon & Co.	Jewelry	run.	full
502	"	2	"	A. W. Roemer	Cigars	"	"
503	"	3	"	Fisk's Boot & Shoe Upper Fact'y	Boot and shoe uppers	"	"
504	"	3	"	Siau Laundering Co.	Laundry work	"	"
505	"	3	"	Amsbary Elec. Dye. & Cl. W'ks.	Dye and clean clothing	"	"
506	"	3	"	Mich. Cloth. Cl'n. & Repair Co.	Clean. and rep. clothes.	"	"
507	"	3	"	Metropolitan Steam Dye House.	Dye and clean clothing.	"	"
508	"	6	"	Cambridge Steam Laundry	Laundry work	"	"
509	"	6	"	Wagner Baking Co.	Bread and cake	"	"
510	"	6	"	Monarch Laundry	Laundry work	"	"
511	"	6	"	Metropolitan Home Bakery	Bread and cake	"	"
512	"	6	"	W. B. Hibbard	" " "	"	"
513	"	7	"	Michigan Baking Co.	" " "	"	"
514	"	7	"	North End Laundry	Laundry work	"	"
515	"	7	"	C. Fay	Bread and cake	"	"
516	"	7	"	Edison Illuminating Co.	Electric light	"	"
517	"	7	"	C. P. Collins & Co.	Cigars	"	"
518	"	7	"	Cuban & Turkish Cigar Tob. Co.	"	"	"
519	"	7	"	Detroit Coöperative Ci. M'f'g Co.	"	"	"
520	"	10	"	The Banner Laundering Co.	Laundry work	"	"
521	"	10	"	Michigan Picture Co.	Mouldings and frames.	"	"
522	"	10	"	London Steam Laundry	Laundry work	"	"
523	"	10	"	Palace Steam Laundry	" "	"	"
524	"	10	"	Hoyt's Steam Laundry	" "	"	"
525	"	10	"	Detroit Roller Mills	Flour and feed	idle	......
526	"	10	"	Waterloo Yeast Co.	Twin Bros. yeast	run.	full
527	"	10	"	A. A. Hupers	Cigars.	"	"
528	"	10	"	J. M. Flinn & Co.	Ice cream	"	"
529	"	13	"	Auberlin Cycle M'f'g Co.	Bicycles	"	"
530	"	13	"	Home Bakery	Bread and cake	"	"
531	"	13	"	Detroit Glove Works	Gloves	"	part
532	"	13	"	Wolverine Laundering Co.	Laundry work	"	full
533	"	13	"	F. Wittelsberger	Bread and cake	"	"
534	"	13	"	A. Bader	" " "	"	"
535	"	13	"	Boston Bakery	Bread	"	"
536	"	13	"	Paul R. Bader	"	"	"
537	"	14	"	Star Laundry	Laundry work	"	"
538	"	14	"	L. W. Humphrey	Bread and cake	"	"
539	"	14	"	A. Erschig	Wagons	"	"
540	"	14	"	Hamilton, Carhartt & Co.	Clothing	"	part
541	"	14	"	Wm. Rowe	Job printing	"	full
542	"	14	"	Wm. Heimbuch	Cigars	"	"
543	"	15	"	Henry Kehler	Wagons	"	"
544	"	15	"	Trilby Hand Laundry	Laundry work	"	"
545	"	15	"	John Mayer	Bread and cake	"	"
546	"	15	"	Mathes Bros.	Wagons	"	"
547	"	15	"	Detroit Flower Pot Factory	Flower pots	"	part
548	"	16	"	B. J. Tafeyta	Men's clothing	"	full
549	"	16	"	O. R. Stellmacher	Bread	"	"
550	"	16	"	A. Laffrey	Sash, doors and blinds	"	part

District No. 1. ***Wm. F. Tripp, Deputy Inspector.***

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity.	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water-closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
54	54	30	14	----	$750	----	----	------	9	60	----	yes	yes	yes	no	yes	yes	yes	yes	yes	----	----	501
54	54	5	3	1	125	----	1	no	9	60	----	----	----	"	"	‡	----	----	"	"	yes	----	502
54	54	20	4	3	250	----	----	------	9	60	----	yes	yes	"	"	yes	yes	no	"	"	"	----	503
54	54	24	5	19	400	----	----	------	9	†30	----	no	"	"	"	‡	"	yes	"	"	"	----	504
60	60	14	8	----	300	----	----	------	10	60	----	----	"	"	"	‡	"	"	"	"	----	----	505
60	60	10	9	1	325	----	----	------	10	60	----	----	"	"	"	‡	----	"	"	"	yes	----	506
60	60	12	5	4	300	----	----	------	10	60	----	----	"	"	"	‡	yes	"	"	"	"	----	507
54	54	28	5	23	600	----	----	------	9	†30	yes	----	"	"	"	‡	"	"	"	"	"	----	508
54	54	6	5	1	225	----	----	------	9	60	----	----	"	"	"	‡	----	----	"	"	"	----	509
54	54	18	4	12	400	----	----	------	9	60	----	----	"	"	"	yes	yes	yes	"	"	"	----	510
54	54	6	3	2	200	----	----	------	9	60	----	----	----	"	"	‡	----	----	"	"	"	----	511
54	54	10	6	4	300	----	----	------	9	60	----	----	yes	"	"	‡	yes	yes	"	"	"	----	512
54	54	6	3	2	150	----	----	------	9	60	----	----	"	"	"	‡	----	----	"	"	"	----	513
54	54	20	7	11	350	----	----	------	9	60	----	----	"	"	"	‡	yes	yes	"	"	"	----	514
54	54	5	4	1	150	----	----	------	9	60	----	----	----	"	"	‡	----	----	"	"	"	----	515
72	72	6	6	----	300	----	----	------	10	60	----	----	yes	"	"	‡	yes	yes	"	"	----	----	516
48	48	60	6	----	350	----	----	------	8	60	----	----	"	"	"	‡	----	----	"	"	----	----	517
48	48	10	5	2	275	2	2	no	8	60	----	----	----	"	"	‡	----	----	"	"	yes	----	518
48	48	10	4	1	175	----	----	------	8	60	----	----	yes	"	"	yes	----	----	"	"	"	----	519
54	54	130	14	96	2,600	----	8	*	9	†30	----	yes	"	"	"	"	yes	yes	"	"	"	----	520
60	60	25	6	----	150	----	----	------	10	60	----	----	"	"	"	"	----	----	"	"	----	----	521
54	54	25	4	12	450	----	----	------	9	60	----	----	"	"	"	‡	yes	yes	"	"	yes	----	522
54	54	38	12	24	850	----	----	------	9	†30	----	----	"	"	"	‡	"	"	"	"	"	----	523
54	54	30	11	19	750	----	2	yes	9	60	----	yes	"	"	"	‡	"	"	"	"	"	----	524
60	--	6	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	---	525
54	54	14	7	4	550	----	----	------	9	60	----	no	yes	yes	no	yes	yes	no	yes	yes	yes	----	526
48	48	5	4	----	125	----	----	------	8	60	----	----	----	"	"	‡	----	----	"	"	----	----	527
60	60	20	20	----	1,000	----	----	------	10	†30	----	yes	yes	"	"	yes	yes	yes	"	"	----	----	528
60	60	20	6	----	250	----	----	------	10	†30	----	"	"	"	"	"	"	"	"	"	----	----	529
54	54	5	3	2	175	----	----	------	9	60	----	----	"	"	"	‡	---	----	"	"	yes	----	530
60	48	10	1	3	100	----	----	------	10	60	----	----	----	"	"	‡	yes	----	"	"	"	---	531
54	54	12	5	5	300	----	----	------	9	60	----	---	----	"	"	‡	"	yes	"	"	"	----	532
54	54	17	13	2	550	----	----	------	9	60	----	---	yes	"	"	‡	"	"	"	"	"	----	533
54	54	8	6	2	300	----	----	------	9	60	----	----	"	"	"	‡	----	---	"	"	"	----	534
54	54	5	4	1	170	----	----	------	9	60	----	----	"	"	"	‡	----	----	"	"	"	----	535
54	54	5	4	1	150	----	----	------	9	60	----	----	"	"	"	‡	----	---	"	"	"	----	536
54	54	5	2	3	125	----	----	------	9	60	----	----	"	"	"	‡	----	----	"	"	"	----	537
54	54	4	3	1	125	----	----	------	9	60	----	----	"	"	"	‡	----	----	"	"	"	----	538
60	60	5	5	----	230	----	----	------	10	†30	----	----	"	"	"	‡	----	----	"	"	----	----	539
54	45	230	13	174	2,800	----	13	*	9	†30	yes	----	"	"	"	‡	yes	yes	"	"	yes	----	540
54	54	12	6	----	200	----	----	------	9	60	----	----	"	"	"	‡	"	"	"	"	----	----	541
48	48	12	8	1	300	----	----	------	8	60	---	----	----	"	"	‡	----	----	"	"	yes	----	542
60	60	5	4	----	200	----	----	------	10	†30	----	----	yes	"	"	‡	----	----	"	"	----	----	543
54	54	8	2	4	150	----	----	------	9	60	----	----	"	"	"	‡	----	----	"	"	yes	----	544
54	54	5	3	1	125	----	----	------	9	60	----	----	"	"	"	‡	----	----	"	"	"	----	545
60	60	6	5	----	200	----	----	------	10	60	----	----	"	"	"	‡	----	----	"	"	----	----	546
60	54	20	8	----	300	----	----	------	10	†30	----	----	"	"	"	‡	yes	yes	"	"	----	----	547
60	60	12	3	1	150	----	----	------	10	60	----	---	----	"	"	‡	"	"	"	"	yes	----	548
60	60	6	5	1	110	----	----	------	10	60	----	----	yes	"	"	‡	----	----	"	"	"	----	549
60	54	45	20	----	800	----	----	------	10	60	----	yes	"	"	"	‡	yes	yes	"	"	----	----	550

*** Not all. † Permit given by inspector. ‡ None required.**

Inspection book No. 12. **TABLE No. 1.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
551	July	16	Detroit	West Detroit Chair Co.	Chairs	run.	full
552	"	16	"	Chas. Pregizer	Bread and cake	"	"
553	Aug.	5	"	Chas. Derain	Bread	"	"
554	"	5	"	Eagle Cigar Mf'g Co.	Cigars	"	"
555	"	5	"	Benedict Bros. Mf'g Co.	"	"	"
556	"	5	"	Western Knitting Mills	Knit goods	"	part
557	"	6	"	Blakeslee & Co	Clothing	"	full
558	"	6	"	Wayne Laundry	Laundry work	"	"
559	"	6	"	Wright Cycle Co.	Bicycles	"	"
560	"	6	"	Gray Bros.	Wagons and carriages	"	"
561	"	6	"	Crescent Machine Co.	Machinery and nails	"	"
562	"	7	"	Trojan Laundry	Laundry work	"	"
563	"	7	"	Towar's Wayne Co. Creamery	Butter and milk	"	"
564	"	7	"	Brown & Jewell	Printed matter	"	"
565	"	7	"	The Casket and Shell Co.	Caskets	"	"
566	"	7	"	J. C. Wilson Carriage Co.	Carriages	"	"
567	"	7	"	Detroit Cigar Box Mf'g Co.	Cigar boxes	"	"
568	"	10	"	Ives & Wolf	Wagons	"	"
569	"	10	"	Detroit Steam Carpet Cl'ng Wk's	Cleaning carpets	"	"
570	"	10	"	R. Helson	Buildings	"	"
571	"	10	"	Teakle & Golden	Buildings	"	"
572	"	10	"	Haste & Harris	Crackers	"	"
573	"	11	"	Kennedy & Greig	Machinery	"	"
574	"	11	"	Cass Steam Laundry	Laundry work	"	"
575	"	11	"	Princess Steam Laundry	" "	"	"
576	"	11	"	Cent'l Wagon & Carriage Factory	Wagons and carriages	"	"
577	"	11	"	J. J. Utter	Wagons	"	"
578	"	12	"	Excelsior Corset Works	Corsets	"	"
579	"	12	"	Castle Baking Co.	Bread	"	"
580	"	12	"	Wagoner Baking Co.	"	"	"
581	"	12	"	New England Bakery	Bread and cakes	"	"
582	"	12	"	Phœnix Wire Works, No. 2	Iron and wire goods	"	"
583	"	13	"	C. P. Crawford	Wagons	"	"
584	"	13	"	Troy Laundry	Laundry work	"	"
585	"	13	"	Phœnix Laundry	" "	"	"
586	"	13	"	F. Smiley	Wagons	"	"
587	"	13	"	Detroit Tobacco Co.	Cigars	"	"
588	"	13	"	Detroit Cash Register Co.	Cash register	"	"
589	"	13	"	Wm. Eby & Son	Sash, doors and blinds	"	"
590	"	13	"	Detroit Railway Co.	Street cars	"	"
591	"	13	"	J. D. Scovel	Planing mill	"	part
592	"	14	"	Hesch & Clark	Machinery	"	full
593	"	14	"	Alvord & Co.	Stationer's supplies	"	"
594	"	14	"	Mich. Ornamental Glass Co.	Ornamental glass	"	"
595	"	14	"	J. B. Wilson & Co.	Machinery	"	"
596	"	14	"	Canada Malt Co.	Malt	"	"
597	"	17	"	Hees, McFarlane & Co.	Window shades	"	"
598	"	17	"	Lake Superior Graphite Co.	Pulverized graphite	"	"
599	"	17	"	Detroit Graphite Mf'g Co.	Paints and lubricants	"	"
600	"	17	"	A. Backus, Jr., & Sons	Lumber and boxes	"	part

District No. 1. *Wm. F. Tripp, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying of dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	28	15	----	$550	----	----	------	10	60	----	---	yes	yes	no	†	yes	yes	yes	yes	----	----	551
60	60	5	3	2	100	----	----	------	10	60	----	----	"	"	"	†	----	----	"	"	yes	---	552
54	54	5	4	1	125	----	----	------	9	60	----	----	"	"	"	†	----	----	"	"	"	----	553
48	48	80	4	68	1,000	----	10	yes	8	60	yes	----	"	"	"	†	yes	yes	"	"	"	----	554
48	48	6	4	----	200	----	----	------	8	60	----	----	"	"	"	yes	----	----	"	"	----	----	555
60	57	215	5	145	8,200	----	7	yes	10	60	yes	no	"	"	"	"	yes	yes	"	"	yes	----	556
54	54	10	2	6	225	----	----	------	9	60	----	----	"	"	"	†	"	"	"	"	"	----	557
54	54	15	8	12	450	----	----	------	9	*30	----	yes	"	"	"	yes	"	"	"	"	"	----	558
60	60	6	8	1	150	----	----	------	10	*30	----	----	"	"	"	†	"	"	"	"	"	----	559
60	60	50	20	----	1,000	----	----	------	10	*30	----	no	"	"	"	yes	"	"	"	"	----	----	560
60	60	84	83	1	1,200	----	----	------	10	*30	----	"	"	"	"	"	"	"	"	"	yes	----	561
54	54	50	8	42	1,100	----	----	------	9	*30	----	yes	"	"	"	"	"	"	"	"	"	----	562
60	60	42	42	----	1,400	----	----	------	10	60	----	"	"	"	"	†	"	"	"	"	----	1	563
54	54	5	4	----	175	----	----	------	9	60	----	----	----	"	"	†	"	"	"	"	----	----	564
60	60	80	7	----	250	----	----	------	10	*30	yes	no	yes	"	"	yes	"	"	"	"	----	----	565
60	60	20	12	----	450	----	----	------	10	*30	"	"	"	"	"	"	"	"	"	"	----	----	566
60	60	10	6	----	180	----	----	------	10	*30	----	----	"	"	"	†	"	"	"	"	----	----	567
60	60	6	5	----	225	----	----	------	10	60	----	----	"	"	"	†	----	----	"	"	----	----	568
60	60	15	11	----	400	----	----	------	10	60	----	----	"	"	"	†	yes	yes	"	"	---	----	569
60	60	40	20	----	800	----	----	------	10	60	----	---	"	"	"	†	----	----	"	"	----	----	570
60	60	50	20	----	800	----	----	------	10	60	----	----	"	"	"	†	yes	yes	"	"	----	----	571
60	60	85	32	----	900	----	5	yes	10	60	----	----	"	"	"	†	"	"	"	"	----	----	572
60	60	12	12	----	500	----	----	------	10	*30	----	----	"	"	"	†	"	"	"	"	----	----	573
54	54	12	6	6	800	----	----	------	9	60	----	----	"	"	"	†	"	"	"	"	yes	----	574
54	54	10	4	6	300	----	----	------	9	60	----	----	"	"	"	†	"	"	"	"	"	----	575
60	60	12	8	----	300	----	----	------	10	*30	----	----	"	"	"	†	----	----	"	"	----	----	576
60	60	5	5	----	175	----	----	------	10	*30	----	----	"	"	"	†	----	----	"	"	----	----	577
54	54	12	2	4	200	----	----	------	9	60	----	----	"	"	"	†	----	----	"	"	yes	----	578
60	60	6	5	1	185	----	----	------	10	60	----	----	"	"	"	†	----	----	"	"	"	----	579
54	54	40	38	2	1,500	----	1	yes	9	60	----	----	"	"	"	†	yes	yes	"	"	"	----	580
54	54	6	5	2	180	----	----	------	9	60	----	----	"	"	"	†	---	----	"	"	"	----	581
60	60	25	12	----	400	----	----	------	10	60	----	----	"	"	"	†	yes	yes	"	"	----	----	582
60	60	7	8	----	100	----	----	------	10	60	----	----	"	"	"	†	----	----	"	"	----	----	583
54	54	14	7	5	850	----	----	------	9	60	----	----	"	"	"	†	yes	yes	"	"	yes	----	584
54	54	12	5	1	200	----	----	------	9	60	----	----	"	"	"	†	"	"	"	"	"	----	585
60	60	7	8	----	100	----	----	------	10	60	----	----	"	"	"	†	----	----	"	"	----	----	586
60	60	20	8	2	150	----	----	------	10	60	----	----	"	"	"	†	----	----	"	"	yes	----	587
60	60	30	12	----	500	----	----	------	10	60	----	----	"	"	"	†	yes	yes	"	"	----	----	588
60	60	20	6	----	280	----	----	------	10	60	----	----	no	"	"	†	"	no	"	"	----	---	589
60	60	20	20	----	1,000	----	----	------	10	60	----	----	----	"	"	†	"	yes	"	"	----	----	590
60	48	9	2	----	75	----	----	------	10	60	----	----	yes	"	"	†	"	"	"	"	----	----	591
60	60	15	10	---	400	----	----	------	10	*30	----	no	"	"	"	yes	"	"	"	"	----	----	592
60	60	15	4	2	200	----	----	------	10	60	----	----	"	"	"	"	"	"	"	"	yes	----	578
60	60	20	12	----	400	----	----	------	10	60	----	no	"	"	"	†	"	"	"	"	----	----	594
60	60	25	25	----	800	----	----	------	10	60	yes	----	"	"	"	†	"	"	"	"	----	----	595
60	60	9	4	----	200	----	----	------	10	60	"	----	"	"	"	yes	"	"	"	"	----	----	596
60	60	50	37	14	1,650	----	----	------	10	60	"	no	"	"	"	"	"	"	"	"	yes	----	597
60	65	4	4	----	150	----	----	------	10	60	----	----	"	"	"	†	"	"	"	"	----	----	598
60	60	12	8	---	500	----	----	------	10	60	yes	yes	"	"	"	†	"	"	"	"	----	----	599
60	54	150	90	1	1,800	----	10	yes	10	45	----	no	"	"	"	yes	"	"	"	"	yes	----	600

* Permit given given by inspector. † None required.

Inspection book No. 13. **TABLE No. 1.—Continued.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold	Running or idle?	If running, is it full or part time?
601	Aug. 18	Detroit	Chas. Pohlman	Furniture	run.	part
602	" 18	"	Mich. Central Elevator Co. (A.)	Grain	"	full
603	" 18	"	Mich. Central Elevator Co. (B.)	"	"	"
604	" 18	"	Union Depot Elevator Co.	"	"	"
605	" 18	"	Belnap & Essler	Wagons and trucks	"	"
606	" 19	"	Detroit Smelting & Repair'g Wk.	Brass goods	"	"
607	" 19	"	Wm. Steinbrecher	Wagons	"	"
608	" 19	"	Detroit Gas Co.	Gas	"	"
609	" 19	"	E. Starret	Lumber	"	part
610	" 19	"	H. Heames & Son	Lime and stone	"	full
611	" 20	"	Schulte Soap Co.	Soap	"	"
612	" 20	"	H. Houghton	Lime and stone	"	"
613	" 20	"	Yeomans & Cheesebrough	Lumber and boxes	"	"
614	" 20	"	Morton & Cressy	Dressed lumber	"	part
615	" 20	"	Western Engine Works	Engines	"	full
616	" 24	"	Michigan Malleable Iron Works.	Malleable iron	"	"
617	" 24	"	Gardner Elevator Co.	Elevators	"	"
618	" 24	"	John Beyster	Lumber and boxes	"	"
619	" 24	"	J. Sprenger & Sons	Boilers	"	"
620	" 24	"	Coller Steam Yachts & Engine Co.	Yachts and engines	idle	......
621	" 25	"	Clark Dry Dock Co.	Steam ships	run.	full
622	" 25	"	Galvin Valve & Hydrant Works.	Valves and hydrants	idle	......
623	" 25	"	Detroit Cement Sewer Pipe Wk's	Sewer pipes	run	full
624	" 26	"	Michigan Peninsular Forge	Rod and bar iron	"	"
625	" 26	"	Fort Wayne & Belle Isle R'y Co.	Electric power	"	"
626	" 26	"	Fort Wayne & Belle Isle R'y Co.	Street cars	"	"
627	" 26	"	Detroit Cop'r & Brass Rl'g Mills	Copper and brass goods.	"	"
628	" 26	"	Detroit Chemical Works	Acid phosphate	"	"
629	" 27	"	U. S. Heater Co.	Steam & hot air furnaces	"	"
630	" 27	"	McRae & Roberts Co.	Steam and brass goods.	"	"
631	" 27	"	Michigan Casket Co.	Caskets	"	part
632	" 27	"	Michigan Automatic Gate Co.	Elevator gates	"	full
633	" 28	"	Detroit Paper Bag Co.	Paper bags	"	part
634	" 28	"	International Optical Lens Co.	Optical goods	"	full
635	" 28	"	John Whittaker & Co.	Building material	"	"
636	" 28	"	Chas. Fitzsimmons & Co.	Clothing	"	"
637	Sept. 8	"	Cummings Conduit Co.	Piping	"	"
638	" 8	"	Buhl Stamping Co.	Lanterns and milk cans	"	"
639	" 8	"	The Wolverine Printing Co.	Printed matter	"	"
640	" 8	"	Detroit Journal	Newspaper	"	"
641	" 8	"	Philip Christa & Sons	Stone and marble	"	"
642	" 9	"	Diamond Match Co.	Matches	"	"
643	" 10	"	William Wright & Co.	Furniture	"	part
644	" 10	"	Mannausa & Wieber	Printed matter	"	"
645	" 10	"	Frederick F. Ingram & Co.	Drugs and perfumes	"	full
646	" 10	"	Peninsular Stove Co.	Stoves and ranges	"	"
647	" 11	"	W. G. Young & Co.	Cut stone	"	"
648	" 11	"	David Patterson	Statuary & monuments	"	"
649	" 11	"	Armorete Interior Conduit Co.	Conduit piping	"	"
650	" 11	"	Schilling Corset Co.	Corsets	"	"

District No. 1. ***Wm. F. Tripp, Deputy Inspector.***

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	48	50	31	....	$1,150	....	....	......	10	*30	....	yes	yes	yes	no	yes	yes	yes	yes	yes	....	....	601
60	40	24	3	....	130	....	....	......	10	60	yes	....	"	"	"	"	"	"	"	"	....	....	602
60	60	15	9	....	475	....	....	......	10	60	"	....	"	"	"	"	"	"	"	"	....	....	603
60	60	30	15	....	600	....	....	......	10	60	"	....	"	"	"	"	"	"	"	"	....	....	604
60	60	12	8	....	400	....	....	......	10	60	....	....	"	"	"	†	....	....	"	"	....	....	605
60	60	20	6	....	250	....	....	......	10	*30	no	....	"	"	"	†	yes	yes	"	"	....	....	606
60	60	6	4	....	175	....	....	......	10	60	....	....	....	"	"	†	....	....	"	"	....	....	607
60	60	38	30	1	1,800	....	....	......	10	60	....	yes	yes	"	"	†	yes	yes	"	"	....	....	608
60	54	20	12	....	400	....	....	......	10	60	....	....	....	"	"	†	no	"	"	"	....	....	609
60	60	20	20	....	800	....	....	......	10	60	....	....	yes	"	"	†	yes	"	"	"	....	....	610
60	60	12	8	....	280	....	....	......	10	60	yes	no	"	"	"	†	"	"	"	"	....	....	611
60	60	41	40	1	1,050	....	....	......	10	60	....	....	"	"	"	†	"	"	"	"	yes	....	612
60	60	65	40	1	1,450	....	....	......	10	*30	....	....	"	"	"	†	"	"	"	"	"	....	613
60	48	20	7	....	250	....	....	......	10	*30	....	....	....	"	"	†	"	"	"	"	....	....	614
60	60	5	5	....	185	....	....	......	10	*30	....	....	....	"	"	†	"	"	"	"	....	....	615
60	60	200	135	1	500	....	1	yes	10	60	....	yes	yes	"	"	yes	"	"	"	"	yes	....	616
60	60	35	25	1	1,300	....	....	......	10	60	....	"	"	"	"	†	"	"	"	"	"	....	617
60	60	32	32	....	1,150	....	....	......	10	*30	....	....	"	"	"	†	"	"	"	"	....	....	618
60	60	20	5	....	200	....	....	......	10	60	....	....	....	"	"	†	"	"	"	"	....	....	619
60	..	15	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	620
60	60	150	10	....	400	....	....	......	10	*30	....	....	yes	yes	no	†	yes	yes	yes	yes	....	....	621
60	..	50	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	622
60	60	5	4	....	150	....	....	......	10	60	....	....	....	yes	no	†	....	....	yes	yes	....	....	623
60	60	400	300	....	11,500	....	....	......	10	*30	....	....	yes	"	"	†	yes	yes	"	"	....	....	624
72	72	10	10	....	500	....	....	......	10	60	....	....	"	"	"	†	"	"	"	"	....	....	625
60	60	18	18	....	900	....	....	......	10	60	....	no	"	"	"	†	"	"	"	"	....	....	626
60	60	300	250	....	9,500	....	....	......	10	*30	....	....	"	"	"	†	"	"	"	"	....	....	627
72	72	12	12	....	450	....	....	......	10	*30	....	yes	"	"	"	yes	"	"	"	"	....	....	628
60	60	70	34	4	700	....	....	......	10	*30	....	....	"	"	"	†	"	"	"	"	yes	....	629
57	57	150	71	6	3,700	....	....	......	10	*30	....	yes	"	"	"	†	"	"	"	"	"	....	630
60	54	12	5	....	175	....	....	......	10	*30	yes	....	no	"	"	yes	"	"	"	"	....	....	631
60	60	8	4	....	150	....	....	......	10	60	....	yes	yes	"	"	"	"	"	"	"	....	....	632
60	48	12	4	2	250	....	....	......	10	60	yes	....	"	"	"	"	....	....	"	"	yes	....	633
60	60	14	13	1	500	....	....	......	10	60	....	....	"	"	"	†	yes	yes	"	"	"	....	634
54	54	30	6	....	225	....	....	......	9	*30	....	....	"	"	"	†	"	"	"	"	"	....	635
54	54	75	4	2	250	....	....	......	9	*30	....	....	....	"	"	†	"	"	"	"	"	....	636
60	60	30	6	....	200	....	....	......	10	60	....	....	yes	"	"	†	....	....	"	"	....	....	637
60	60	125	50	....	1,500	....	19	yes	10	*30	yes	no	"	"	"	yes	yes	yes	"	"	....	....	638
54	54	30	16	2	600	....	....	......	9	60	....	....	"	"	"	†	"	"	"	"	yes	....	639
54	54	125	120	5	7,000	....	....	......	9	60	....	....	"	"	"	yes	"	"	"	"	"	....	640
60	60	20	20	....	800	....	....	......	10	*30	yes	....	"	"	"	"	"	"	"	"	....	1	641
60	60	584	147	234	7,350	....	22	yes	10	*30	"	no	"	"	"	"	"	"	"	"	yes	....	642
60	48	100	6	....	300	....	....	......	10	60	....	"	"	"	"	"	"	"	"	"	....	....	643
60	54	10	7	....	260	....	....	......	10	*30	....	....	"	"	"	†	"	"	"	"	....	....	644
60	60	42	19	23	1,440	....	....	......	10	*30	yes	yes	"	"	"	yes	"	"	"	"	....	....	645
60	60	500	500	....	27,500	....	4	yes	10	*30	"	no	"	"	"	"	"	"	"	"	....	....	646
48	48	16	7	....	300	....	....	......	9	60	....	....	....	"	"	†	....	....	"	"	....	....	647
54	54	20	6	....	350	....	....	......	9	60	....	....	....	"	"	†	yes	yes	"	"	....	....	648
60	60	15	10	1	400	....	....	......	10	45	yes	....	yes	"	"	†	"	"	"	"	yes	....	649
60	60	280	22	258	6,000	....	6	yes	10	60	....	....	"	"	"	yes	"	no	"	"	"	....	650

* Permit given by inspector. † None required.

Inspection book No. 14. **TABLE No. 1.—Continued.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
651	Sept. 11	Detroit	Nelson, Baker & Co.	Pharmacy goods	run.	part
652	“ 11	“	Price's Bakery	Bread	“	full
653	“ 11	“	Sequin's Bakery	Pies	“	“
654	“ 14	Leesville	Wm. Christy Brick Yards	Brick	“	“
655	“ 14	“	Seifferlein & Seiger	“	idle	......
656	“ 14	“	A. Trombly	“	run.	full
657	“ 14	Greiner	F. P. Juif	Flour and feed	“	“
658	“ 14	“	Wm. Schoenheit	Lumber and timber	idle	......
659	“ 15	Detroit	The Universal Elevator Co.	Elevators	“	......
660	“ 15	Highland P'k	The McAlpine Shoe Factory	Shoes	run.	full
661	“ 15	“ “	Kaighin & Price	Varnish	“	“
662	“ 15	Detroit	Frank J. Dingeman	Dressed lumber	“	part
663	“ 16	“	Winfield & Kuhn	Carriages	“	full
664	“ 16	“	H. S. Robinson & Co	Boots and shoes	“	“
665	“ 16	“	Penberthy Injector Co.	Injectors	“	“
666	“ 16	“	Coronet Corset Co.	Corsets	“	“
667	“ 16	“	F. A. Hubel Gelatine Capsule W'ks	Capsules	“	“
668	“ 17	“	Martin Mairer & Co.	Trunks	“	part
669	“ 17	“	Lichtenberg & Sons	Beans and grains	“	full
670	“ 17	“	Detroit Flower Pot Factory	Flower pots	“	“
671	“ 17	“	Michigan Galvanizing Works	Galvanized iron	“	“
672	“ 18	“	Michigan Wire & Iron Works	Iron and wire goods	“	“
673	“ 18	“	Parker, Webb & Co.	Meats, etc.	“	“
674	“ 21	“	Hammond, Standish & Co.	Meats and provisions	“	“
675	“ 21	“	Mead & Co.	Machinery	“	part
676	“ 21	“	West Side Lumber Co.	Lumber and boxes	“	“
677	“ 21	“	Hasty & Sons	Barrels	“	“
678	“ 22	“	Stephen Pratt Boiler Works	Boilers and tanks	“	“
679	“ 22	“	Peninsular Electric Light Co.	Light and power	“	full
680	“ 22	“	Detroit Bridge & Iron Works	Bridges	“	“
681	“ 22	“	Griffin Car Wheel Co.	Car wheels and castings	“	part
682	“ 23	“	John Brennen & Co.	Boilers	“	“
683	“ 23	“	Detroit Range Boiler Co.	Boilers and tanks	“	full
684	“ 23	“	M. McNamara	Varnish	“	“
685	“ 23	“	Ferrin Bros. & Co.	Sorted beans	“	“
686	“ 23	“	Detroit Stave & Heading Works.	Staves and headings	“	part
687	“ 24	“	R. Fraedrichs	Tables	“	full
688	“ 24	“	Michigan Peninsular Car Co.—Foundry department	Castings	“	part
689	“ 24	“	Michigan Peninsular Car Co.—Pipe department	Water pipes	“	full
690	“ 24	“	Michigan Peninsular Car Co.—Car department	Freight cars	idle	......
691	“ 24	“	Frank W. May	Lumber and timber	“	......
692	“ 25	“	C. W. Restrick	Lumber and mouldings.	run.	part
693	“ 25	“	J. Woodham's Box Factory	Boxes	“	“
694	“ 25	“	U. S. Truck Co.	Truck handles, etc.	“	full
695	“ 25	“	Columbia Brush Fiber Co.	Brushes	“	part
696	“ 25	“	John Rothfuss & Son	Bread and cakes	“	full
697	“ 25	“	C. B. Hutchings & Sons	Car roofing	“	“
698	“ 28	“	Kennedy Basket M'f'g. Co.	Baskets	idle	......
699	“ 28	“	Union Veneer Barrell Co.	Barrels	run.	part
700	“ 28	“	William Munroe	Sash, doors, etc.	“	“

District No. 1. ***W. F. Tripp, Deputy Inspector.***

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females, employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection?	No. given factory for 1896.
54	48	120	32	38	$2,650	....	4	yes	9	60	....	no	yes	yes	no	yes	yes	yes	yes	yes	yes	....	651
54	54	9	6	....	225	....	....	......	9	60	....	....	"	"	"	†	....	....	"	"	....	....	652
54	54	6	4	1	225	....	....	......	9	60	....	....	"	"	"	†	....	....	"	"	yes	....	653
54	54	24	24	....	1,000	....	1	yes	9	60	....	....	....	"	"	†	yes	yes	"	"	....	....	654
54	--	18	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	655
54	54	12	5	....	200	....	....	......	9	60	....	....	....	yes	no	†	yes	yes	yes	yes	....	....	656
60	60	4	3	....	150	....	....	......	10	60	yes	....	yes	"	"	†	"	"	"	"	....	...	657
60	--	8	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	658
60	--	75	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	659
60	60	30	15	7	850	....	....	......	10	*30	yes	yes	yes	yes	no	†	yes	yes	yes	yes	yes	....	660
60	60	5	4	....	200	....	....	......	10	60	"	"	"	"	"	†	....	"	"	"	....	....	661
60	54	26	12	....	600	....	....	......	10	*30	....	....	"	"	"	yes	yes	"	"	"	....	....	662
60	60	10	8	....	375	....	....	......	10	60	....	no	"	"	"	†	....	....	"	"	....	....	663
60	60	100	42	24	2,500	....	....	......	10	60	yes	"	"	"	"	yes	yes	no	"	"	yes	....	664
60	60	80	80	....	3,500	....	....	......	10	60	"	"	"	"	"	"	"	yes	"	"	....	....	665
54	54	50	3	2	225	....	....	......	9	60	....	yes	"	"	"	"	"	"	"	"	yes	....	666
57	57	200	8	142	4,200	....	....	......	9	60	....	no	"	"	"	"	"	"	"	"	"	....	667
60	48	85	10	....	550	....	....	......	10	60	....	"	"	"	"	"	"	"	"	"	....	....	668
60	60	60	4	....	200	....	....	......	10	60	....	....	"	"	"	"	"	"	"	"	....	....	669
60	60	18	14	....	500	--	4	yes	10	60	....	....	"	"	"	†	"	"	"	"	....	....	670
60	60	10	4	....	200	....	....	......	10	*30	....	....	....	"	"	†	"	"	"	"	....	....	671
60	60	150	85	18	3,200	....	6	yes	10	*30	yes	no	yes	"	"	yes	"	no	"	"	yes	....	672
60	60	125	125	....	8,500	....	1	"	10	60	"	....	"	"	"	†	"	yes	"	"	....	....	673
60	60	125	125	....	6,000	....	....	......	10	60	....	yes	"	"	"	†	"	"	"	"	....	....	674
60	54	20	8	....	300	....	....	......	10	*30	yes	....	"	"	"	†	"	"	"	"	....	....	675
60	54	26	20	1	700	....	....	......	10	*30	....	....	....	"	"	†	"	"	"	"	yes	....	676
60	48	80	30	....	1,400	....	....	......	10	45	....	....	yes	"	"	†	"	"	"	"	....	....	677
60	30	80	6	....	300	....	....	......	10	*30	....	....	--	"	"	†	"	"	"	"	....	....	678
72	72	14	14	....	700	....	....	......	10	60	....	....	yes	"	"	†	"	"	"	"	....	....	679
60	60	310	140	....	3,000	....	....	......	10	*30	....	....	"	"	"	†	"	"	"	"	....	....	680
60	30	200	85	....	2,900	....	....	......	10	*30	yes	yes	"	"	"	†	"	no	"	"	....	....	681
60	48	100	60	....	2,100	....	3	yes	10	*30	....	....	....	"	"	†	"	yes	"	"	....	....	682
60	60	20	17	....	450	....	....	......	10	*30	....	....	....	"	"	†	"	"	"	"	....	1	683
60	60	4	3	....	150	....	....	......	10	60	....	....	....	"	"	†	"	"	"	"	....	....	684
60	60	40	4	30	550	....	3	no	10	60	yes	....	yes	"	"	†	"	"	"	"	yes	....	685
60	30	125	12	....	375	....	....	......	10	*30	....	....	....	"	"	†	"	"	"	"	....	....	686
60	60	30	15	....	500	....	....	......	10	60	....	....	yes	"	"	†	"	"	"	"	....	....	687
60	48	575	115	....	2,675	....	....	......	10	*30	yes	no	"	"	"	†	"	"	"	"	....	....	688
60	60	150	150	....	3,500	...	....	......	10	*30	"	"	"	"	"	†	"	"	"	"	....	....	689
60	--	1800	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	690
60	--	20	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	691
60	54	20	12	....	375	....	....	......	10	*30	....	....	....	yes	no	†	yes	no	yes	yes	....	....	692
60	54	18	5	....	200	....	....	......	10	*30	....	...	yes	"	"	yes	"	"	"	"	....	....	693
60	60	150	20	....	650	....	2	no	10	*30	....	....	"	"	"	†	"	yes	"	"	....	....	694
60	54	30	6	4	280	....	....	......	10	*30	yes	....	"	"	"	†	"	"	"	"	yes	....	695
60	60	5	4	1	150	....	....	......	10	60	....	....	"	"	"	†	....	....	"	"	"	....	696
60	60	14	8	....	350	....	....	......	10	45	....	...	"	"	"	†	yes	yes	"	"	....	....	697
60	--	30	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	698
60	48	12	4	....	180	....	....	......	10	*30	....	....	yes	yes	no	†	yes	yes	yes	yes	....	....	699
60	54	34	20	....	600	....	2	no	10	*30	....	....	"	"	"	†	"	"	"	"	....	....	700

* Permit given by inspector. † None required.

Inspection book No. 15. **TABLE No. 1.—Continued.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
701	Sept. 28	Detroit	Roe Stephens M'f'g Co............	Brass and iron valves...	run.	full
702	" 28	"	United Marble Co................	Marble...................	idle	......
703	" 29	"	Barber Asphalt Paving Co.......	Paving...................	"	......
704	" 29	"	Warren-Scharf Asphalt Pav. Co.	"	"	......
705	" 29	"	Howard-Northwood Malt M'f.Co.	Malt	run.	full
706	" 29	"	Williams Bros. & Charbonneau..	Pickles, vinegar, etc.....	"	"
707	" 29	"	Gearing & Co..................	Building material.......	"	part
708	" 30	"	National Pin Co................	Pins.....................	"	full
709	" 30	"	David Stotts Flouring Mills......	Flour....................	"	"
710	" 30	"	Electric Gas Stove Co............	Gas stoves...............	"	"
711	" 30	"	Detroit Brass Works.............	Brass goods..............	"	part
712	" 30	"	A. Carbeille.....................	Building material.......	"	"
713	" 30	"	Ortman & Groat	Stone....................	"	full
714	Oct. 1	"	The E. G. Daily Co..............	Canned goods............	"	"
715	" 1	"	H. A. Beebe & Co................	Stone....................	"	"
716	" 1	"	Wolverine Manufacturing Co....	Furniture	"	"
717	" 1	"	Western Bermudez Co...........	Asphalt paving..........	"	"
718	" 1	"	Michigan Stone and Supply Co...	Stone	"	"
719	" 2	"	J. M. Jamison & Co..............	Clean grain..............	"	"
720	" 2	"	Detroit Lubricator Co............	Lubricators, etc.........	"	"
721	" 2	"	The Hertz & Hasbach Co.........	Sash, doors and blinds..	"	part
722	" 2	"	Detroit Lumber and Box Factory	Lumber and boxes......	"	"
723	" 2	"	Pound's Machine and Tool W'ks	Machinery and tools....	idle	......
724	" 2	"	Detroit Steel and Spring Co......	Merch. steel & st'l sp'ngs	run.	full
725	" 6	"	John P. Liberman................	Cigars...................	"	"
726	" 6	"	The Michigan Volksblatt..........	Newspaper	"	"
727	" 6	"	Detroit Stained Glass Works	Glass goods..............	"	"
728	" 6	"	William Linderman...............	Trucks and wagons.....	"	"
729	" 6	"	George J. Hech..................	Printed matter..........	"	"
730	" 6	"	F. Deinzer & Co.................	Furniture	"	"
731	" 7	"	M. King & Son	Clothing.................	"	"
732	" 7	"	F. Bassenberger..................	Candies	"	"
733	" 7	"	J. Freda & Son	Men's clothing..........	"	"
734	" 7	"	Globe Laundry....................	Laundry work...........	"	"
735	" 7	"	A. M. Pereira & Sons.............	Printed matter..........	"	part
736	" 7	"	George J. Roesinger..............	Cigars	idle	......
737	" 8	"	Detroit Willow Goods	Willow goods............	run.	full
738	" 8	"	Jackson & Jacobs................	Boy's pants..............	"	part
739	" 8	"	A. Jacobs & Co...................	Men's clothing..........	"	"
740	" 8	"	J. F. Weber & Co.................	Planing mill	"	"
741	" 8	"	Behr Bros........................	Hides and skins.........	"	full
742	" 8	"	C. Bauman & Sons................	Wagons and trucks.....	"	"
743	" 9	"	Alois Laitner....................	Brushes..................	"	part
744	" 9	"	Progressive Cigar Co.............	Cigars....................	"	full
745	" 9	"	J. E. Mederlander................	"	"	"
746	" 9	"	The Nonpariel M'f'g Co..........	Men's clothing..........	"	"
747	" 9	"	J. Pumer.........................	" "	"	"
748	" 9	"	John Johnson......................	Awnings and tents......	"	"
749	" 12	"	Gruber & Wilson	Brushes..................	"	part
750	" 12	"	Goebel Brewing Co...............	Beer.....................	"	full

District No. 1. ***W. F. Tripp, Deputy Inspector.***

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. h'rs males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	120	70	2	$2,675	....	....	......	10	45	yes	no	yes	yes	no	yes	yes	yes	yes	yes	yes	....	701
60	..	30	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	702
60	..	40	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	703
60	..	30	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	704
60	60	30	30	....	1,600	....	....	......	10	60	yes	yes	yes	yes	no	yes	yes	yes	yes	yes	....	....	705
60	*	150	80	30	1,850	....	2	yes	10	‡30	"	"	"	"	"	"	"	"	"	"	yes	....	706
60	54	150	35	....	1,350	....	....	......	10	60	....	....	"	"	"	§	"	"	"	"	....	....	707
60	60	95	29	66	2,200	....	5	yes	10	‡30	yes	no	"	"	"	yes	"	"	"	"	yes	....	708
72	72	55	55	....	2,200	....	....	......	10	60	....	....	"	"	"	"	"	"	"	"	....	....	709
60	60	50	25	1	800	....	....	......	10	60	....	no	"	"	"	§	"	"	"	"	yes	....	710
60	54	12	8	....	350	....	....	......	10	60	....	....	"	"	"	§	"	"	"	"	....	....	711
60	54	20	6	....	225	....	....	......	10	60	....	....	"	"	"	§	....	....	"	"	....	....	712
54	54	30	10	....	550	....	....	......	9	60	....	....	"	"	"	§	yes	yes	"	"	....	....	713
60	60	120	10	50	800	....	10	yes	10	‡30	....	yes	"	"	"	§	"	"	"	"	yes	....	714
54	54	8	4	....	200	....	....	......	9	60	....	....	....	"	"	§	....	....	"	"	....	....	715
60	60	160	157	3	3,800	....	5	†	10	45	....	no	yes	"	"	yes	yes	yes	"	"	yes	....	716
60	60	20	6	....	250	....	....	......	10	60	....	....	"	"	"	§	"	"	"	"	....	....	717
60	60	40	12	....	500	....	....	......	10	60	....	....	....	"	"	§	"	"	"	"	....	....	718
60	60	4	4	....	180	....	....	......	10	60	yes	....	yes	"	"	yes	"	"	"	"	....	....	719
60	60	200	110	....	3,500	....	3	yes	10	‡30	"	no	"	"	"	"	"	"	"	"	....	....	720
60	54	65	37	....	1,750	....	3	"	10	‡30	"	....	"	"	"	§	"	"	"	"	....	....	721
60	54	60	53	....	1,700	....	4	"	10	‡30	....	....	"	"	"	§	"	"	"	"	....	....	722
60	..	10	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	723
60	60	500	60	2	2,500	....	....	......	10	‡30	....	....	yes	yes	no	§	yes	yes	yes	yes	yes	....	724
48	48	15	6	2	350	....	....	......	8	60	yes	....	"	"	"	§	....	....	"	"	no	....	725
54	54	20	20	....	1,100	....	....	......	9	60	"	no	"	"	"	yes	yes	yes	"	"	....	....	726
60	60	20	20	....	800	....	....	......	9	60	"	....	"	"	"	"	....	....	"	"	....	....	727
60	60	18	12	....	500	....	....	......	10	60	....	yes	"	"	"	§	....	....	"	"	....	....	728
54	54	5	4	....	150	....	....	......	9	60	....	....	"	"	"	§	yes	yes	"	"	....	....	729
60	60	20	15	1	500	....	1	yes	10	60	....	no	"	"	"	yes	....	....	"	"	yes	....	730
60	60	12	4	....	200	....	....	......	10	60	....	....	"	"	"	§	yes	yes	"	"	....	....	731
60	60	30	11	18	750	....	....	......	10	60	yes	no	"	"	"	no	"	"	"	"	no	....	732
60	60	30	5	17	600	....	1	yes	10	60	....	....	"	"	"	yes	"	"	"	"	yes	....	733
54	54	12	4	4	250	....	....	......	9	60	yes	....	"	"	"	§	"	"	"	"	"	....	734
60	48	4	3	....	100	....	....	......	10	60	....	....	"	"	"	§	"	"	"	"	"	....	735
48	..	8	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	736
60	60	8	3	....	100	....	....	......	10	60	....	....	yes	yes	no	§	....	....	yes	yes	....	....	737
60	48	20	4	12	400	....	....	......	10	‡30	....	....	"	"	"	yes	yes	yes	"	"	yes	....	738
60	54	60	8	32	900	....	2	no	10	‡30	....	yes	"	"	"	"	"	"	"	"	"	....	739
60	48	20	6	....	200	....	....	......	10	‡30	....	....	no	"	"	§	"	"	"	"	....	....	740
60	60	20	5	....	175	....	....	......	10	60	....	yes	yes	"	"	§	....	....	"	"	....	....	741
60	60	12	6	....	250	....	....	......	10	60	....	....	"	"	"	§	....	....	"	"	....	....	742
60	48	10	3	2	100	....	....	......	10	60	....	....	"	"	"	§	....	....	"	"	....	....	743
48	48	8	4	2	200	....	....	......	8	60	....	....	"	"	"	§	....	....	"	"	....	....	744
48	48	5	3	1	110	....	....	......	8	60	....	....	"	"	"	yes	....	....	"	"	....	....	745
60	60	30	5	9	350	....	1	yes	10	60	....	no	"	"	"	§	yes	yes	"	"	yes	....	746
60	60	6	2	3	125	....	1	"	10	60	....	....	....	"	"	§	....	....	"	"	"	....	747
60	60	6	4	....	150	....	....	......	10	60	....	....	....	"	"	§	....	....	"	"	....	....	748
60	54	14	3	3	175	....	....	......	10	‡30	....	....	yes	"	"	§	yes	yes	"	"	yes	....	749
60	60	60	60	....	3,800	....	....	......	10	60	....	yes	"	"	"	yes	"	"	"	"	....	....	750

*** 90 hours-running overtime. † Not all. ‡ Permit given by inspector. § None required.**

Inspection book No. 16. **TABLE No. 1.—Continued.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
751	Oct. 12	Detroit	C. Rohde	Wagons	run.	full
752	“ 12	“	C. Lempke	“	“	“
753	“ 12	“	Hoffman Manufacturing Co.	Furniture	“	“
754	“ 12	“	G. W. Larkins & Co.	Dressed lumber	“	part
755	“ 13	“	J. G. Junker	Wagons and carriages	“	full
756	“ 13	“	The Reed Boltz Mnf'g Co.	Furniture	idle	......
757	“ 13	“	Steinheiser Bros.	Sewer pipe	run.	full
758	“ 13	“	The Royal Brewing Co.	Beer	“	“
759	“ 13	“	Otto Schemansky	Marble and stone	“	part
760	“ 13	“	Kansler & Brey	Wagons	“	full
761	“ 14	“	A. Osebold	Furniture	“	part
762	“ 14	“	Nagel & Lemke	Wagons	“	full
763	“ 14	“	Posselius Bros., Furn. Mf'g Co.	Furniture	“	part
764	“ 14	“	A Posselius & Co.	“	“	“
765	“ 14	“	Aertz, Meyers & Co.	“	“	“
766	“ 15	“	Farrand & Votey Organ Co.	Organs	“	“
767	“ 15	“	Detroit Motor Co.	Electric motors	idle	......
768	“ 15	“	J. E. Bolles & Co.	Iron and wire goods	run.	part
769	“ 15	“	North Detroit Feed Mill	Feed	“	“
770	“ 16	“	Detroit White Lead Works	White lead	“	“
771	“ 16	“	Johnson Carriage Co	Carriages	“	“
772	“ 16	“	American Harrow Co.	Farm implements	“	full
773	“ 16	“	Detroit Tinware Mnf'g Co.	Tinware	“	part
774	“ 16	“	Jenks & Muir Manufacturing Co.	Bedsteads & mattresses	“	full
775	“ 19	“	Art Stove Co.	Stoves	“	part
776	“ 19	“	Fontaine Crossing & Electric Co.	Dynamos and motors	“	“
777	“ 19	“	Force & Dickinson	Staves and hoops	“	“
778	“ 19	“	O. Krause	Baked goods	“	full
779	“ 19	“	Detroit Mnf'g Novelty Co.	Spring beds and cots	“	part
780	“ 19	“	O. D. Widman & Co.	Mirrors and mouldings.	“	“
781	“ 20	“	Schwanbeck Bros.	Mouldings and frames	“	“
782	“ 20	“	Becker & Mohan	Wagons	“	full
783	“ 20	“	J. Vander Gyp & Son	Dressed lumber	idle	......
784	“ 20	“	J. Seidel	“ “	“	......
785	“ 20	“	G. V. Lasch	Beer barrels	run.	part
786	“ 20	“	American Blower Co.	Exhaust fans, vent's etc.	“	full
787	“ 21	“	Mich. Pen. Car Co.—Car Dep't	Freight cars	“	“
788	“ 21	“	Mich. Pen. Car Co.—Wheel Dep't	Car wheels	“	“
789	“ 21	“	Murphy, Wasey & Co.	Chairs and rockers	“	“
790	“ 22	“	Anderson Manufacturing Co.	Carriages and sleighs	“	“
791	“ 22	“	Michigan Railway Supply Co.	Railway supplies	“	part
792	“ 22	“	Rumsey Manufacturing Co.	Sleighs and carts	“	full
793	“ 22	“	Decoy Fly Paper Co.	Fly paper	“	part
794	“ 22	“	Craddock Manufacturing Co.	Stock shingles	“	“
795	“ 22	“	Murrin Granolithic Stone Co.	Stone	“	“
796	“ 23	“	Huebner Screen Door Co.	Screen doors	“	“
797	“ 23	“	F. D. Zacharias	Tables	idle	......
798	“ 23	“	American Rad'r Co.-Mich. Plant	Radiators	run.	full
799	“ 23	“	Detroit Varnish Co.	Varnish	“	“
800	“ 23	“	Leland & Faulconer Mf'g Co.	Machinery and tools	“	“

District No. 1. *Wm. F. Tripp, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	15	15	....	$600	....	....	......	10	60	yes	no	no	yes	no	yes	yes	yes	yes	yes	....	-	751
60	60	5	4	....	125	....	....	......	10	60	....	....	yes	"	"	†	....	....	"	"	....	....	752
60	60	24	24	....	700	1	2	no	10	*30	....	....	no	"	"	yes	yes	yes	"	"	....	....	753
60	54	40	18	....	650	....	....	......	10	60	....	....	yes	yes	"	†	"	"	"	"	....	....	754
60	60	5	4	....	200	....	....	......	10	60	....	....	"	"	"	†	....	....	"	"	....	....	755
60	..	30	....	....	....	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	756
60	60	6	6	....	180	....	....	......	10	60	....	....	....	yes	no	†	....	....	yes	yes	....	....	757
60	60	4	4	....	175	....	....	......	10	60	....	....	no	"	"	†	yes	yes	"	"	....	....	758
60	48	6	4	....	175	....	....	......	10	60	....	....	....	"	"	†	....	....	"	"	....	....	759
60	60	6	4	....	180	....	....	......	10	60	....	....	yes	"	"	†	....	....	"	"	....	....	760
60	48	10	6	....	250	....	....	......	10	60	....	....	"	"	"	†	yes	yes	"	"	....	....	761
60	60	6	4	....	175	....	....	......	10	60	....	....	....	"	"	†	....	....	"	"	....	....	762
60	54	100	79	....	2,300	....	8	yes	10	45	yes	no	yes	"	"	yes	yes	yes	"	"	....	....	763
60	54	25	16	....	750	....	....	......	10	45	....	"	"	"	"	"	"	"	"	"	....	....	764
60	30	60	36	....	1,300	....	1	yes	10	45	....	"	"	"	"	"	"	"	"	"	....	....	765
60	54	250	113	2	5,300	....	....	......	10	60	....	"	"	"	"	"	"	"	"	"	yes	....	766
60	..	150	....	....	....	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	767
60	54	150	40	1	1,550	....	....	......	10	45	....	no	yes	yes	no	yes	yes	yes	yes	yes	yes	....	768
60	30	4	3	....	100	....	....	......	10	60	....	....	"	"	"	†	"	"	"	"	....	....	769
60	42	75	60	8	3,000	....	....	......	10	60	....	no	"	"	"	yes	"	"	"	"	yes	....	770
60	48	12	6	....	260	....	....	......	10	60	....	....	....	"	"	†	....	....	"	"	....	....	771
60	60	160	71	4	2,500	....	....	......	10	45	....	....	....	"	"	†	yes	yes	"	"	yes	....	772
60	48	16	7	1	130	....	4	yes	10	*30	....	....	yes	"	"	†	"	"	"	"	"	....	773
60	60	100	88	12	3,000	....	....	......	10	45	yes	yes	"	"	"	†	"	"	"	"	"	....	774
60	54	176	144	1	4,500	....	....	......	10	45	....	"	"	"	"	yes	"	"	"	"	"	....	775
60	54	32	8	....	450	....	....	......	10	*30	....	....	....	"	"	†	"	"	"	"	....	....	776
60	54	65	16	....	500	....	....	......	10	45	....	....	....	"	"	†	"	"	"	"	....	....	777
54	54	6	3	2	190	....	....	......	9	60	....	....	yes	"	"	†	....	....	"	"	yes	....	778
60	48	20	10	....	870	....	1	no	10	*30	....	....	"	"	"	†	no	no	"	"	....	....	779
60	54	140	77	3	2,400	....	6	"	10	45	....	....	"	"	"	†	yes	yes	"	"	yes	2	780
60	48	65	31	4	1,500	....	1	yes	10	45	....	....	"	"	"	†	"	"	"	"	"	....	781
60	60	6	4	....	120	....	....	......	10	60	....	....	"	"	"	†	....	....	"	"	....	....	782
60	..	20	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	783
60	..	6	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	784
60	51	20	10	....	380	....	....	......	10	*30	....	....	yes	yes	no	†	yes	yes	yes	yes	....	....	785
60	60	120	98	2	3,250	....	....	......	10	45	....	no	"	"	"	yes	"	"	"	"	yes	....	786
60	60	1100	1100	....	35,600	....	6	no	10	45	yes	....	"	"	"	†	"	"	"	"	....	....	787
60	60	200	150	....	4,000	....	....	......	10	45	....	yes	"	"	"	†	"	"	"	"	....	....	788
60	60	400	250	100	9,500	....	49	no	10	45	yes	"	"	"	"	yes	"	"	"	"	yes	2	789
60	60	120	58	2	2,400	....	1	yes	10	45	"	"	"	"	"	†	"	"	"	"	"	....	790
60	54	60	12	....	600	....	....	......	10	45	....	....	....	"	"	†	"	"	"	"	....	....	791
60	60	35	26	....	1,100	....	1	yes	10	45	....	no	yes	"	"	yes	"	"	"	"	....	....	792
60	48	25	8	....	400	....	....	......	10	*30	yes	....	"	"	"	†	"	"	"	"	....	....	793
60	54	50	44	....	1,250	....	10	yes	10	*30	....	....	"	"	"	†	"	"	"	"	....	1	794
60	54	12	10	....	325	....	....	......	10	*30	....	....	"	"	"	†	"	"	"	"	....	....	795
60	54	20	12	....	400	....	3	yes	10	45	....	....	....	"	"	†	"	"	"	"	....	....	796
60	..	6	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	797
60	60	400	300	2	12,000	....	....	......	10	60	....	yes	yes	yes	no	†	yes	yes	yes	yes	yes	2	798
60	60	15	7	1	300	....	....	......	10	45	....	"	"	"	"	†	"	"	"	"	"	....	799
60	60	150	58	2	2,800	....	....	......	10	45	yes	"	"	"	"	yes	"	"	"	"	"	4	800

* Permit given by inspector. † None required.

Inspection book No. 17. **TABLE No. 1.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
801	Oct.	26	Detroit	Meier & Schuknecht	Trunks and bags	run.	full
802	"	26	"	O. P. Hazard & Co	Clothing	"	"
803	"	26	"	D. L. I. Cigar Factory	Cigars	"	"
804	"	26	"	Merchant Printing Co	Printed matter	"	"
805	"	26	"	Howe Mf'g Co	Envelopes & ship'ing tgs.	"	part
806	"	27	"	Harrington & Ouelette	Cigars	"	full
807	"	27	"	William Nageborn	Machinery	"	"
808	"	27	"	Graham Printing Co	Printed matter	"	"
809	"	27	"	Pierson & Hough	Horse collars	"	part
810	"	28	"	The Detroit Ideal Paint Co	Paints	"	full
811	"	28	"	Detroit Electric Soap Co	Soap	"	part
812	"	28	"	Safety Furnace Pipe Co	Furnace pipe	"	"
813	"	28	"	Detroit Metal and Heating W'ks.	Sheet metal & heat. app.	"	"
814	"	28	"	Kurtz Paper Box Co	Paper boxes	"	"
815	"	28	"	J. T. Wing's Metal and Oil W'ks.	Metal and oil	"	full
816	"	29	"	Detroit Block Works	Tackle blocks	"	part
817	"	29	"	The Geo. W. Cope Pattern W'ks.	Stove patterns	"	full
818	"	30	"	Decker Mf'g Co	Metal specialties	"	part
819	"	30	"	Brotherton, Breitmeyer & Co	Seeds and grains	"	full
820	"	30	"	Pudrith & Candler	Roofing and cornice	"	"
821	"	30	"	M. J. White & Co	Cards and signs	"	part
822	"	30	"	W. C. Heath R. R. Printing Co	Printed matter	"	full
823	Nov.	2	"	Commerc'l Milling Co., Mill No. 1	Flour and feed	"	"
824	"	2	"	Commerc'l Milling Co., Mill No. 2	Cornmeal and feed	"	"
825	"	2	"	L. J. Wohnlich	Metal specialties	"	part
826	"	2	"	Michigan Cigar Box Co	Cigar boxes	"	"
827	"	2	"	C. B. Seitz & Son	Wood turn. & band saw.	"	"
828	"	2	"	De Croupet Iron Co	Iron goods	"	"
829	"	3	"	The Pharmacists Cigar Co	Cigars	"	full
830	"	3	"	The Standard Gas Fixture Co	Gas fixtures	"	part
831	"	3	"	Geo. F. Doemling	Furniture	"	"
832	"	4	"	Melins Saw Co	Saws	"	"
833	"	4	"	Veneer Package Mf'g Co	Wood packages	"	"
834	"	4	"	Knechtel & Bowman	Novelties	"	"
835	"	4	"	Gray, Toynton & Fox	Candies	"	full
836	"	4	"	U. S. Bak. Co. Vail & Cream Bk'ry	Crackers and biscuits	"	"
837	"	5	"	J. H. A. Haberkorn	Building material	"	part
838	"	4	"	John J. Bagley & Co	Tobacco	"	full
839	"	5	"	Detroit Lithographic Co	Lithographing	"	"
840	"	5	"	W. P. Holliday	Paper boxes	"	"
841	"	6	"	Globe Tobacco Co	Tobacco	"	part
842	"	6	"	A. Neubronner	Wagons	"	full
843	"	6	"	Boydell Bros., No. 1	Paints and putty	"	"
844	"	6	"	Boydell Bros., No. 2	Paints and colors	"	"
845	"	6	"	Anderson Cycle and Mf'g Co	Bicycles	"	part
846	"	7	"	E. F. Lee Glass Works	Ornamental glass	"	full
847	"	7	"	Charles Flach	Furniture	"	part
848	"	7	"	Hollenberg & Liebig	Machinery	"	"
849	"	9	"	Pfaudler Vacuum Ferment. Co	Glass lined tanks	"	full
850	"	9	"	Detroit Safe Co	Safes and vaults	"	part

District No. 1. *Wm. F. Tripp, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	45	18	2	$1,200	----	----	------	10	*30	----	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	----	801
54	54	100	6	----	350	----	----	------	9	60	yes	no	"	"	"	"	"	"	"	"	----	----	802
48	48	4	2	----	80	----	----	------	8	60	----	----	"	"	"	†	----	----	"	"	----	----	803
54	54	5	4	----	225	----	----	------	9	60	----	----	"	"	"	yes	yes	yes	"	"	----	----	804
60	54	8	2	4	200	----	----	------	10	60	----	----	"	"	"	"	"	"	"	"	yes	----	805
48	48	12	2	2	125	----	----	------	8	60	----	----	"	"	"	"	----	----	"	"	"	----	806
60	60	12	5	----	180	----	----	------	10	*30	----	----	"	"	"	†	yes	yes	"	"	----	----	807
54	54	30	18	2	700	----	----	------	9	60	----	no	"	"	"	yes	"	"	"	"	yes	----	808
60	54	26	16	----	550	----	----	------	10	*30	----	"	"	"	"	"	"	"	"	"	----	----	809
60	60	12	5	2	325	----	----	------	10	60	yes	"	"	"	"	"	"	"	"	"	yes	----	810
60	54	20	5	----	224	----	----	------	10	60	"	"	"	"	"	"	"	"	"	"	----	----	811
60	54	16	8	----	400	----	----	------	10	*30	----	"	"	"	"	"	----	----	"	"	----	----	812
60	54	35	24	----	950	----	----	------	10	60	----	"	"	"	"	"	yes	yes	"	"	----	----	813
60	57	52	10	40	1,000	----	4	yes	10	45	----	yes	"	"	"	"	"	"	"	"	yes	----	814
60	60	6	4	----	180	----	----	------	10	60	----	----	"	"	"	†	"	"	"	"	----	----	815
60	54	10	5	----	250	----	----	------	10	60	----	----	"	"	"	yes	"	"	"	"	----	----	816
60	60	50	20	----	1,200	----	----	------	10	60	----	----	"	"	"	"	"	"	"	"	----	----	817
60	48	43	24	2	925	----	----	------	10	*30	----	no	"	"	"	"	"	"	"	"	yes	----	818
60	60	20	4	10	350	----	----	------	10	60	----	"	"	"	"	"	"	"	"	"	"	----	819
54	54	10	10	----	250	----	----	------	9	*30	----	----	"	"	"	†	"	----	"	"	----	----	820
60	54	10	4	2	180	----	----	------	10	60	----	----	"	"	"	†	----	----	"	"	yes	----	821
54	54	8	8	----	350	----	----	------	9	60	yes	----	"	"	"	†	yes	yes	"	"	----	----	822
72	72	18	18	---	750	----	----	------	10	60	"	no	"	"	"	yes	"	"	"	"	----	----	823
72	72	28	26	2	900	----	----	------	10	60	"	"	"	"	"	"	"	"	"	"	yes	----	824
60	54	6	5	----	175	----	----	------	10	60	----	----	"	"	"	†	"	"	"	"	----	----	825
60	48	40	19	13	875	----	----	------	10	60	yes	----	"	"	"	yes	"	"	"	"	yes	----	826
60	48	6	4	---	180	----	----	------	10	*30	----	----	"	"	"	†	"	"	"	"	----	----	827
60	54	12	7	----	250	----	----	------	10	*30	----	----	"	"	"	†	"	"	"	"	----	----	828
48	48	30	24	6	1,050	----	1	no	8	60	----	----	"	"	"	†	----	----	"	"	yes	----	829
60	48	10	4	----	150	----	----	------	10	60	----	----	"	"	"	†	yes	yes	"	"	----	----	830
60	54	10	4	----	200	----	----	------	10	60	----	----	no	"	"	yes	"	"	"	"	----	----	831
60	54	20	6	----	250	----	----	------	10	60	----	----	"	"	"	†	----	"	no	"	----	----	832
60	54	8	6	----	225	----	----	------	10	60	----	no	yes	"	"	†	yes	"	yes	"	----	----	833
60	54	12	6	----	250	----	----	------	10	60	----	"	"	"	"	yes	"	"	"	"	----	----	834
60	60	150	80	70	3,800	----	4	yes	10	60	----	yes	"	"	"	no	"	"	"	"	yes	----	835
54	54	80	45	23	3,200	----	----	------	9	60	----	"	"	"	"	yes	"	"	"	"	"	----	836
60	54	50	20	----	800	----	----	------	10	*30	----	----	"	"	"	†	"	"	"	"	----	----	837
57	57	200	50	125	5,000	----	5	yes	10	60	yes	yes	"	"	"	yes	"	"	"	"	yes	1	838
54	54	40	20	----	1,200	----	----	------	9	60	----	"	"	"	"	"	"	"	"	"	----	----	839
57	57	250	35	195	3,500	---	33	no	9	*30	----	"	"	"	"	"	"	"	"	"	yes	----	840
60	57	200	80	120	5,200	----	---	------	10	*30	yes	no	"	"	"	"	"	"	"	"	"	----	841
60	60	6	4	----	150	----	----	------	10	*30	----	----	"	"	"	†	----	----	"	"	----	--	842
60	60	18	14	----	1,500	----	----	------	10	*30	yes	no	"	"	"	yes	yes	yes	"	"	----	----	843
60	60	14	14	----	1,400	----	----	------	10	*30	----	yes	"	"	"	"	"	"	"	"	----	----	844
60	54	50	19	1	1,000	----	1	yes	10	*30	----	"	"	"	"	"	"	"	"	"	yes	----	845
54	54	10	5	----	250	----	---	------	9	*30	----	"	"	"	"	"	"	"	"	"	----	----	846
60	54	50	10	----	325	----	----	------	10	*30	----	----	"	"	"	"	"	"	"	"	----	----	847
60	54	6	8	----	120	----	---	------	10	*30	----	----	----	"	"	†	"	"	"	"	----	----	848
60	60	60	18	----	960	----	---	------	10	50	----	----	yes	"	"	†	"	"	"	"	----	----	849
60	54	150	85	----	1,700	----	---	------	10	50	----	no	"	"	"	yes	"	"	"	"	----	----	850

* Permit given by inspector. † None required.

Inspection book No. 18. **TABLE No. 1.—Concluded.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
851	Nov.	9	Detroit	J. Michels & Co.	Woodworking machin'y	run.	full
852	"	9	"	Reinhold Machine Co.	Special machinery	"	"
853	"	9	"	Eagle Paper Box Co.	Paper boxes	"	"
854	"	10	"	Hayes File Co.	Files	"	"
855	"	10	"	Phœnix Wire Works	Woven wire goods	"	part
856	"	10	"	John Phillips & Co.	Show cases	"	"
857	"	10	"	Philip Drinkaus & Co.	Mouldings and frames	"	full
858	"	10	"	Thiry, Feldmann & Co.	Dressed lumber	"	part
859	"	10	"	Smith & McDonald	Stone	"	full
860	"	10	"	Adamantine Plaster Co.	Plaster	idle	......
861	"	11	"	Am. Radiator Co. (Detroit plant)	Radiators	run.	full
862	"	11	"	Russell Wheel & Foundry Co.	Logging cars and foundry work	"	part
863	"	11	"	Acme White Lead & Color Works	Varnish	"	full
864	"	11	"	Thomas Pharmacal Co.	Resinoids	"	"
865	"	12	"	Peninsular Emery Wheel Co.	Emery wheels	"	"
866	"	12	"	Buick & Sherwood Mfg. Co., No. 1	Water closets	"	"
867	"	12	"	Buick & Sherwood Mfg. Co., No. 2	Bath tubs	"	"
868	"	12	"	Empire Fibre Co.	Interlinings	idle	......
869	"	12	"	Schulenburg Manufacturing Co.	Billiard tables	run.	part
870	"	12	"	Banner Tobacco Co.	Tobacco	"	full
871	"	12	"	Banner Cigar Mfg. Co.	Cigars	"	"
872	"	13	"	Schober Printing & Stationery Co.	Printed matter	"	"
873	"	13	"	Michigan Steam Laundry	Laundry work	"	"
874	"	13	"	E. Chope & Sons	Wagons and trucks	"	part
875	"	13	"	Detroit Cigar Mfg. Co.	Cigars	"	full
876	"	13	"	J. C. Sullivan & Co.	"	"	"
877	"	13	"	Wright & Gurd	Brooms	"	part
878	"	16	"	Clark Can Co.	Tin cans	"	full
879	"	16	"	Standard Manufacturing Co.	Ladies' underwear	idle	......
880	"	16	"	Pingree & Smith	Shoes	run.	full
881	"	16	"	W. H. Anderson & Sons	Tools and machinery	"	part
882	"	16	"	Electric & Novelty Works	Electrical machines	"	"
883	"	17	"	Detroit Electro Plating Co.	Nickle and brass plating	"	"
884	"	16	"	Globe Brass Works	Water, air & beer pumps	"	full
885	"	17	"	Arthur Colton	Tools and machinery	"	"
886	"	17	"	D. M. Ferry & Co.	Seeds and boxes	"	"
887	"	18	"	C. W. Herbst	Clothing	"	"
888	"	18	"	V. Campros	Cut stone	"	"
889	"	18	"	Detroit Soap Co.	Soap	"	"
890	"	18	"	Daniel Scotten & Co.	Tobacco	"	part
891	"	19	"	Star Cigar Manufacturing Co.	Cigars	"	full
892	"	19	"	Hargreaves Manufacturing Co.	Picture fr'mes & mould's	"	"
893	"	19	"	Frederick Stearns & Co.	Pharmacy goods	"	part
894	"	19	"	Brown Bros.	Cigars	"	"
895	"	20	"	Baldwin, McGraw & Co.	Shoes	"	"
896	"	20	"	McConnell Tailor Co.	Men's clothing	"	full
897	"	20	"	R. Dittrich	" "	"	part
898	"	20	"	Clark Novelty Mfg. Co.	Pillow sham holders	"	"
899	"	20	"	Western Newspaper Union	Ready prints and plates	"	full
900	"	20	"	American Eagle Tobacco Co.	Tobacco	"	"

District No. 1. *W. F. Tripp, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	*	20	12	----	$600	----	----	------	10	†30	----	yes	yes	yes	no	‡	yes	yes	yes	yes	----	----	851
60	60	18	7	----	250	----	----	------	10	†30	----	----	"	"	"	‡	"	"	"	"	----	----	852
60	60	35	7	18	550	----	3	yes	10	†30	yes	yes	"	"	"	yes	"	"	"	"	yes	----	853
60	60	16	7	----	300	----	----	------	10	†30	----	---	"	"	"	‡	"	"	"	"	----	----	854
60	54	20	12	----	875	----	----	------	10	†30	----	---	"	"	"	‡	"	"	"	"	----	----	855
60	48	40	39	1	1,500	----	----	------	10	†30	----	---	"	"	"	yes	"	"	"	"	yes	1	856
60	60	15	4	1	175	----	----	------	10	†30	----	---	"	"	"	"	"	"	"	"	"	----	857
60	54	12	5	----	175	----	----	------	10	†30	----	----	"	"	"	‡	"	"	"	"	----	----	858
54	54	20	5	----	225	----	----	------	9	60	----	----	----	"	"	‡	----	----	"	"	---	----	859
60	--	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	860
60	60	300	290	----	18,000	----	----	------	10	†30	---	yes	yes	yes	no	‡	yes	yes	yes	yes	----	4	861
60	54	250	100	----	6,000	----	----	------	10	†30	----	"	"	"	"	yes	"	no	"	"	----	1	862
60	60	7	7	----	300	----	----	------	10	†30	----	----	"	"	"	‡	"	yes	"	"	----	----	863
60	60	4	3	----	140	----	----	------	10	†30	----	----	"	"	"	‡	"	"	"	"	----	----	864
60	60	10	5	1	200	----	----	------	10	60	----	---	"	"	"	‡	"	"	"	"	yes	----	865
60	60	500	185	60	7,000	----	----	------	10	†30	yes	yes	"	"	"	‡	"	no	"	"	"	1	866
60	60	15	15	----	725	----	----	------	10	†30	----	----	"	"	"	‡	"	yes	"	"	----	----	867
54	--	12	----	----	------	----	----	------	----	----	----	---	----	----	----	----	----	----	----	----	--	----	868
60	54	6	6	----	350	----	----	------	10	60	----	yes	yes	yes	no	yes	yes	----	yes	yes	----	----	869
57	57	120	80	55	2,500	----	----	------	9½	†30	yes	"	"	"	"	"	"	yes	"	"	yes	----	870
48	48	400	75	80	4,800	----	80	yes	8	†30	----	no	"	"	"	"	----	----	"	"	"	----	871
54	54	30	13	3	800	----	----	------	9	60	----	"	"	"	"	"	yes	yes	"	"	"	----	872
54	54	40	9	27	1,000	----	----	------	9	†30	yes	----	"	"	"	"	"	"	"	"	"	----	873
60	54	20	12	----	500	----	----	------	10	60	----	yes	"	"	"	"	"	"	"	"	----	----	874
48	48	170	6	51	1,600	----	----	------	8	60	----	no	"	"	"	"	----	----	"	"	yes	----	875
48	48	50	30	7	1,500	----	----	------	8	60	----	yes	"	"	"	"	----	----	"	"	"	----	876
60	54	10	5	----	170	----	----	------	10	†30	----	----	"	"	"	‡	----	----	"	"	----	----	877
60	60	75	46	----	1,350	----	4	yes	10	†30	----	no	"	"	"	yes	yes	yes	"	"	----	1	878
60	--	165	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	---	-- -	879
54	54	710	285	215	21,000	----	8	yes	9	†30	----	yes	yes	yes	no	yes	yes	yes	yes	yes	yes	2	880
60	57	20	18	----	750	----	----	------	10	†30	----	----	"	"	"	‡	"	"	"	"	----	----	881
60	57	30	25	----	800	----	----	------	10	†30	yes	----	"	"	"	yes	"	"	"	"	----	----	882
60	57	15	10	----	400	----	1	no	10	†30	"	----	"	"	"	‡	"	"	no	"	----	----	883
60	60	20	20	----	750	----	----	------	10	†30	----	no	"	"	"	yes	"	"	yes	"	----	----	884
60	60	15	8	----	350	----	----	------	10	†30	----	"	"	"	"	"	"	"	"	"	----	---	885
60	60	845	159	541	14,500	----	----	------	10	60	----	"	"	"	"	"	"	"	"	"	yes	----	886
54	54	13	6	2	300	----	----	------	9	60	----	----	"	"	"	‡	----	----	"	"	"	----	887
54	54	21	20	1	1,000	----	----	------	9	60	----	----	----	"	"	‡	yes	yes	"	"	"	----	888
60	60	50	31	10	1,400	----	----	------	10	†30	yes	no	no	"	"	yes	"	"	"	"	"	1	889
60	54	919	828	487	1,900	----	12	yes	10	†40	"	"	yes	"	"	"	"	"	"	"	"	----	890
48	48	165	3	37	1,250	----	16	"	8	60	----	"	"	"	"	"	----	----	"	"	"	----	891
60	60	180	151	30	8,200	----	4	"	10	†30	yes	"	"	"	"	"	yes	yes	no	"	"	----	892
54	48	300	166	84	7,000	----	4	"	9	60	"	"	"	"	"	"	"	"	yes	"	"	----	893
60	54	650	19	341	12,200	----	5	"	10	†30	----	"	"	"	"	"	"	"	"	"	"	----	894
60	54	245	57	8	2,375	----	----	------	10	†30	yes	yes	"	"	"	"	"	"	"	"	"	----	895
54	54	10	3	3	200	----	----	------	9	†30	----	----	"	"	"	no	----	----	"	"	"	----	896
60	54	6	3	3	190	----	----	------	10	†30	----	---	"	"	"	"	----	----	"	"	"	----	897
60	57	20	7	----	280	----	1	yes	10	†30	----	no	"	"	"	yes	yes	yes	"	"	----	----	898
57	57	22	20	2	1,150	----	----	------	9½	60	---	"	"	"	"	"	"	"	"	"	yes	----	899
60	60	150	80	65	2,450	----	4	yes	10	†30	yes	"	"	"	"	"	"	"	"	"	"	----	900

* 72-running over-time. † Permit given by inspector. ‡ Non required.

DEDUCTION FROM THE WORK IN DISTRICT NO 1.

This district includes the city of Detroit, and is the most important manufacturing district in the State. The kinds of goods manufactured, handled or sold are varied and numerous, as will be seen by a reference to the table. The inspection in this district has been performed in a creditable manner by Deputy Inspector Wm. F. Tripp, who made the inspection of 900 factories, besides re-visiting a great many previously inspected.

Number factories running of those inspected	862
Number factories idle of those inspected	38
Whole number factories inspected	900
Number running overtime	2
Number factories running full time	658
Number factories running part time	204
Whole number factories running	862

Hours of labor per week.

Hours per week, when running full time	52,222
Hours per week as running at date of inspection	47,158
Loss in hours per week	5,064
Average hours per week for each factory when running full time	56.02
Average hours per week for each factory as running at present	54.7

This loss of 5,064 hours per week when reduced to days means 506.4 days of ten hours each for every week, or 26,332 days for the year. This reduced to months makes a loss of nearly 1,013 months of 26 days each. When computed at $1.14 for each day, the average wages the men receive for their labor, this loss amounts to $30,018.48 annually.

Employés.

Number employed when running full capacity	45,790
Number employed at date of inspectiom	29,705
Loss as compared with when running full capacity	16,085

Number males employed at date of inspection	22,449
Number females employed at date of inspection	7,256
Whole number employed at date of inspection	29,705
Average number employed for each factory running	33.69
Number places where females are employed	384

These figures show a great loss to labor. If these factories were running, and running full capacity, employment would be given to 16,085 more persons. Computed on an average of $1.14 each per day and the loss is nearly $18,337 daily, $476,762 monthly, or $5,721,154 each year. Add to this last number $30,018, the annual loss by reason of factories running short time, and it will be found the annual loss to labor in the factories inspected in this district alone amounts to $5,751,172.

The above shows that the male employés constitute nearly 76 per cent of all employed, while less than 25 per cent are females. By reference to the report of last year it will be seen that the ratio between male and female employés has changed but slightly.

Wages.

Amount of monthly pay roll for factories running	$862,931 00
Average monthly pay roll for each factory	1,000 12
Average monthly pay roll for each employé	29 68
Average daily pay for each employé	1 14

Child Labor and Minors.

Number of children over 14 and under 16 years of age employed.	734
Number of factories where they are employed	144
Number of children under 14 years of age employed	15
Number of factories where they are employed	10
Number of such children ordered discharged	15

This shows that about 17 per cent of these factories employ children over 14 and under 16 years of age. Children under 14 years of age were found employed in but little over one per cent of these factories, and in every instance they were ordered to be immediately discharged.

Number of places where registers are kept and statements filed for children over 14 and under 16 years of age	97
Number of places where registers were not kept nor statements filed	42
Number of places where such registers are kept for some of such children but not for all	5
Whole number of places employing children over 14	144

It will be seen that nearly 67 per cent of these factories employing children were complying with the law in regard to registers and statements. About 30 per cent were not so complying, and were ordered to do so. About 3 per cent were obeying the law in part.

Number factories requiring ten hours a day of males under 18 and females under 21	620
Number factories requiring 9½ hours a day of such employés	6
Number factories requiring 9 hours a day of such employés	182
Number factories requiring 8 hours a day of such employés	54
Whole number factories running	862

Average hours per day required of males under 18 and females under 21, 9⅔.

The law provides that not more than 60 hours of work per week shall be required of minors of this age. In no case was it found to be violated.

Time allowed for dinner.

Number factories where 60 minutes are allowed for dinner	492
Number factories where 50 minutes are allowed for dinner	3
Number factories where 45 minutes are allowed for dinner	49
Number factories where 40 minutes are allowed for dinner	2
Number factories where 30 minutes are allowed for dinner	316
Whole number factories running	862

Less than 45 minutes may be allowed for dinner by consent of the inspector. For various reason permits were given in the 318 cases.

Hoisting shafts and elevators.

Number factories where hoisting shafts and well holes are properly guarded and secured	149
Number factories where they are not properly guarded and secured	6
Number factories not having hoisting shafts and well holes	707
Whole number factories running	862

Number factories where automatic trap doors or gates are provided on all floors where elevators are used	106
Number factories where automatic trap doors or gates are not provided	179
Number factories not having elevators	577
Whole number factories running	862

Stairs, doors and fire escapes.

Number factories where stairs are properly guarded and screened	721
Number factories where they are not properly guarded and screened	20
Number factories not having stairs	121
Whole number factories running	862

Number factories where doors swing outward or slide where practicable	859
Number of factories where doors do not swing outward or slide where practicable	3
Whole number factories running	862

There were no factories in which the doors were locked or bolted during working hours in this district.

Number factories where fire escapes were provided	312
Number factories where fire escapes were not provided	11
Number factories where no fire escapes were necessary	539
Whole number factories running	862

Number of places where registers are kept and statements filed for children over 14 and under 16 years of age...............	97
Number of places where registers were not kept nor statements filed..	42
Number of places where such registers are kept for some of such children but not for all....................................	5
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Whole number factories running	862

Number factories where automatic trap doors or gates are provided on all floors where elevators are used	106
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Number factories not having elevators	577
Whole number factories running	862

Stairs, doors and fire escapes.

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Whole number factories running	862

There were no factories in which the doors were locked or bolted during working hours in this district.

Number factories where fire escapes were provided	312
Number factories where fire escapes were not provided	11
Number factories where no fire escapes were necessary	539
Whole number factories running	862

Machinery.

Number factories where proper shifters are used for throwing on and off belts	638
Number factories where proper shifters are not in use	2
Number factories where shifters are not necessary	222
Whole number factories running	862

Number factories where vats, pans and machinery were properly guarded	578
Number factories where vats, pans and machinery were not properly guarded	18
Number factories where there are no vats, pans and machinery	266
Whole number factories running	862

Sanitary.

Number factories where exhaust fans or dust arresters are provided	114
Number factories where they are not provided	8
Number factories where exhaust fans or dust arresters are not necessary	740
Whole number factories running	862

Number factories provided with suitable washrooms and water closets	858
Number factories not provided with suitable washrooms and water closets	4
Whole number factories running	862

Number factories having separate water closets for females	372
Number factories not having separate water closets for females	10
Number where separate water closets are not necessary	480
Whole number factories running	862

It will be seen that employers are generally obeying the law in protecting their employés from danger while at work. In cases where the necessary precautions for safety and convenience were not provided orders were made that the law must be complied with.

In regard to sanitary conditions, it will be seen that nearly all factories are obeying the law.

In this district there were 50 accidents reported during the year.

CHANGES ORDERED DURING YEAR.

DISTRICT NO. 1.

[The number refers to inspection number in table.]

No. 3.—Ordered five handrails and five railings on stairs.

No. 5.—Ordered elevator enclosed, one handrail, and one railing on stairs.

No. 12.—Ordered automatic gates for elevator.

No. 24.—Ordered automatic gates for elevator.

No. 28.—Automatic gates for elevator ordered.

No. 29.—Ordered automatic gates for elevator.

No. 30.—Automatic gates for elevator ordered.

No. 31.—Ordered water closet repaired.

No. 32.—Closet ordered repaired.

No. 33.—Ordered closet repaired.

No. 36.—Automatic gates ordered.

No. 37.—Ordered automatic gates for elevator.

No. 38.—Ordered registers kept of all children under the age of 16 years.

No. 40.—Ordered front walls of building repaired.

No. 46.—Ordered automatic gates for elevator and one fire escape.

No. 47.—Ordered one hand rail, and one railing for stairs.

No. 48.—Ordered one new closet.

No. 52.—Automatic gates for two elevators ordered.

No. 56.—Ordered automatic gates for rear elevator.

No. 57.—Ordered automatic gates for elevator.

No. 63.—Ordered hoisting shaft enclosed.

No. 67.—Two automatic gates ordered.

No. 69.—Ordered statements placed on file of all children under the age of 16 years.

No. 70.—Ordered all children under the age of 16 years registered, and four automatic gates for elevator.

No. 80.—Ordered statements placed on file of all children employed under the age of 16 years, and automatic gates for elevator.

No. 81.—Ordered automatic gates for elevator.

No. 91.—Ordered registers kept of all children under the age of 16 years.

No. 95.—Automatic gates for elevator ordered.

No. 100.—Ordered automatic gates for two elevators.

No. 102.—Automatic gates for elevator ordered.

No. 109.—Ordered automatic gates for elevator on four floors.

No. 112.—Ordered statements placed on file of all children employed under the age of 16 years.

No. 126.—Ordered automatic gates for elevators on three floors.

No. 150.—Ordered one boy under 14 years of age sent home, and all children under the age of 16 years registered.

No. 154.—Ordered all set screws guarded.

No. 155.—Ordered automatic gates for elevator, one railing for stairs, and all set screws guarded.

No. 158.—Ordered statements placed on file of all children employed under the age of 16 years, and one door at west end on third floor as means of escape in case of fire.

No. 163.—Automatic gates for elevator ordered.

No. 168.—Ordered automatic gates for elevator on two floors.

No. 175.—Automatic gates for elevators on two floors ordered.

No. 181.—Ordered two girls under the age of 14 sent home, and all children under the age of 16 years registered.

No. 183.—Ordered one hatchway guarded.

No. 188.—Ordered closet for males cleaned and repaired.

No. 206.—Ordered statements placed on file of all children employed under the age of 16 years.

No. 210.—Ordered shaft couplings guarded.

No. 212.—Ordered all children registered under the age of 16 years.

No. 232.—Ordered one boy under the age of 14 years sent home, and statements placed on file of all children employed under the age of 16 years.

No. 234.—One handrail, and one railing on stairs ordered.

No. 246.—Ordered statements placed on file of all children employed under the age of 16 years.

No. 301.—Ordered one hatchway enclosed, and automatic gates on one elevator.

No. 302.—Ordered register kept of all children employed under the age of 16 years.

No. 308.—Automatic gates on one elevator ordered.

No. 312.—Ordered blowers for the polishing room.

No. 316.—Ordered statements placed on file of all children under the age of 16 years, and automatic gates on two elevators.

No. 317.—Ordered automatic gates on one elevator.

No. 318.—Automatic gates for elevator ordered.

No. 319.—Ordered automatic gates for elevator.

No. 321.—Ordered automatic gates for elevators on four floors.

No. 322.—Ordered automatic gates for elevators.

No. 324.—Ordered all children employed under the age of 16 registered.

No. 330.—Automatic gates for one elevator ordered.

No. 331.—Ordered blowers for the polishing room.

No. 332.—Ordered statements placed on file of all children employed under the age of 16 years, and automatic gates on elevator.

No. 341.—Ordered new closet for females.

No. 347.—Ordered that all children under the age of 16 be registered.

No. 355.—Automatic gates for elevators ordered for four floors.

No. 356.—Ordered automatic gates for four floors.

No. 357.—Automatic gates for elevators.

No. 358.—Ordered automatic gates for elevator.

No. 360.—Ordered automatic gates for one elevator, on four floors.

No. 361.—Ordered better ventilation for the closet by means of a transom over the door.

No. 362.—Ordered separate closets for females.

No. 365.—Ordered one fire escape on the front.

No. 371.—Ordered statements placed on file of all children employed under the age of 16 years.

No. 372.—Automatic gates for elevator ordered, and separate closet for females.

No. 373.—Ordered one boy under 14 years of age sent home, automatic gates for elevators, and a separate closet for females.

No. 374.—Ordered automatic gates for elevator three floors, and new steps on stairs first floor.

No. 381.—Ordered automatic gates on four floors.

No. 385.—Ordered all children employed under the age of 16 years registered.

No. 386.—Ordered post supports for second floor.

No. 388.—Ordered one boy under 14 years of age sent home, and automatic gates for four floors and basement.

No. 391.—One handrail ordered.

No. 394.—Ordered automatic gates for the elevator on two floors.

No. 400.—Ordered automatic gates for elevator, and fire escape repaired.

No. 410.—Ordered automatic gates for elevator, for three floors.

No. 412.—Ordered rubbish cleaned up in the basement.

No. 413.—Ordered automatic gates for elevator four floors, and obstructions removed from fire escape windows.

No. 420.—Ordered handrails for all stairs, the roof repaired, new floor in the store room, and support for joists in same.

No. 423.—Ordered automatic gates for elevator, on four floors.

No. 431.—Automatic gates for elevator ordered.

No. 432.—Ordered automatic gates for three elevators.

No. 434.—Ordered two girls under the age of 14 sent home, and all children employed under the age of 16 years registered, and guard on the mangle.

No. 436.—Ordered automatic gates for elevator.

No. 437.—Automatic gates for elevator ordered.

No. 438.—Ordered automatic gates for elevator, three floors.

No. 447.—Automatic gates for elevator ordered.

No. 450.—Ordered automatic gates for elevator.

No. 452.—Ordered automatic gates for elevator, five floors.

No. 453.—Ordered automatic gates for elevator, one floor.

No. 454.—Automatic gates for elevator ordered.

No. 459.—Ordered statements placed on file of all children employed under the age of 16 years, and new closet for females.

No. 460.—Ordered automatic gates for elevator, five floors.

No. 463.—Automatic gates for one elevator ordered.

No. 466.—Ordered automatic gates for elevator.

No. 468.—Ordered automatic gates for elevator, three floors.

No. 470.—Ordered all children under the age of 16 years registered, guards for hatchway, and all obstruction removed from fire escape windows.

No. 473.—One handrail ordered.

No. 475.—Ordered automatic gates for two elevators, and opening made to fire escape at fourth floor.

No. 492.—Ordered automatic gates for elevator, and new brakes for elevator.

No. 493.—Ordered cable for front elevator, and elevator gearing repaired.

No. 494.—Ordered automatic gates for elevator, one floor.

No. 495.—Automatic gates for elevator ordered.

No. 496.—Ordered automatic gates for one floor.

No. 497.—Automatic gates for elevator ordered.

No. 498.—Ordered automatic gates for elevator.

No. 502.—Ordered statements placed on file of all children employed under the age of 16 years.

No. 503.—Ordered all set screws guarded.

No. 504.—Ordered automatic gates for elevator for two floors.

No. 518.—Ordered all children under the age of 16 years registered.
No. 520.—Ordered register kept of all children under the age of 16 years.

No. 526.—Ordered automatic gates for elevator, and new cable for same.

No. 540.—Ordered statements placed on file of all children under the age of 16 years.

No. 556.—Ordered automatic gates for elevator.

No. 565.—Automatic gates for elevator ordered.

No. 566.—Ordered automatic gates for elevator.

No. 589.—Ordered two handrails, and one railing on stairs, and all set screws guarded.

No. 592.—Ordered automatic gates for elevator.

No. 597.—Ordered automatic gates for rear elevator.

No. 606.—Ordered one hatchway guarded.

No. 631.—One handrail ordered.

No. 642.—Ordered automatic gates on box factory elevator.

No. 646.—Automatic gates on six elevators ordered.

No. 650.—Ordered all set screws guarded.

No. 651.—Automatic gates for one elevator ordered.

No. 664.—Ordered all set screws, and gearings on three presses guarded.

No. 665.—Automatic gates for one elevator ordered.

No. 672.—Ordered automatic gates for elevator on first floor, and all set screws guarded.

No. 681.—Ordered all set screws guarded.

No. 685.—Ordered all children registered under 16 years of age.

No. 689.—Automatic gates for elevator ordered.

No. 692.—Ordered all set screws guarded.

No. 694.—Ordered statements placed on file with name and ages of all children employed under 16 years of age.

No. 700.—Ordered all children under 16 years of age registered.

No. 701.—Automatic gates for one elevator ordered.

No. 708.—Ordered automatic gates for elevator.

No. 710.—Automatic gates for one elevator ordered.

No. 716.—Ordered registers kept of all children employed under the age of 16 years, and automatic gates for one elevator.

No. 720.—Automatic gates for one elevator ordered.

No. 726.—Ordered automatic gates for one elevator.

No. 730.—Automatic gates for one elevator ordered.

No. 732.—Ordered automatic gates for elevator, ladder to roof and closet for females.

No. 739.—Ordered all children registered under the age of 16 years.

No. 740.—Ordered one handrail.

No. 746.—Automatic gates for elevator ordered.

No. 751.—Ordered two handrails.

No. 753.—Ordered one boy under 14 years of age discharged, all children registered under the age of 16 years, and one handrail.

No. 758.—One handrail ordered.

No. 763.—Automatic gates for two elevators ordered.

No. 764.—Ordered one automatic gate for elevator.

No. 765.—Automatic gates for two elevators ordered.

No. 768.—Ordered elevator gates repaired.

No. 770.—Ordered elevator gates repaired.

No. 779.—Ordered statements placed on file with name and age of children employed under 16 years, shifters on two saws, all set screws and main belt guarded.

No. 780.—Ordered all children registered with name and age under 16 years.

No. 786.—Automatic gates for two elevators ordered.

No. 787.—Ordered statements placed on file with name and age of all children employed under 16 years.

No. 789.—Ordered all children under 16 years of age registered.

No. 793.—Automatic gates for one elevator ordered.

No. 802.—Ordered automatic gates for elevator.

No. 808.—Automatic gates for one elevator ordered.

No. 809.—Ordered automatic gates for elevator.

No. 810.—Automatic gates for one elevator ordered.

No. 811.—Ordered automatic gate for elevator.

No. 812.—Ordered automatic gates for one elevator.

No. 813.—Automatic gates for one elevator ordered.

No. 818.—Ordered automatic gates for elevator.

No. 819.—Automatic gates for elevator ordered.

No. 823.—Automatic gates for elevator ordered.

No. 824.—Ordered automatic gates for elevator.

No. 829.—Ordered statements placed on file with name and age of all children employed under 16 years.

No. 831.—One handrail ordered.

No. 832.—Ordered one handrail, and all set screws guarded.

No. 833.—Automatic gates for elevator ordered.

No. 834.—Ordered automatic gates for one elevator.

No. 835.—Ordered one fire escape repaired.

No. 840.—Ordered all children under 16 years of age registered.

No. 841.—Automatic gates for elevator ordered.

No. 843.—Automatic gates for one elevator ordered.

No. 850.—Ordered automatic gates for two elevators.

No. 862.—Ordered all set screws guarded.

No. 866.—Ordered all set screws guarded.

No. 871.—Automatic gates for one elevator ordered.

No. 872.—Ordered automatic gates for elevator.

No. 875.—Automatic gates for one elevator ordered.

No. 878.—Ordered automatic gates for one elevator.

No. 879.—Ordered automatic gates for elevator.

No. 883.—Ordered all children registered under 16 years of age, and blowers for polishing room.

No. 884.—Automatic gates for elevator ordered.

No. 885.—Automatic gates for elevator ordered.

No. 886.—Ordered automatic gates for elevator.

No. 889.—Ordered automatic gates for two elevators, and handrail for stairway.

No. 890.—Automatic gates for three elevators ordered.

No. 891.—Automatic gates for one elevator ordered.

No. 892.—Ordered automatic gates for one elevator, and bridge connecting buildings rebuilt, also blowers for machine room.

No. 893.—Ordered automatic gates for four elevators.

No. 894.—Automatic gates for one elevator ordered.

No. 896.—Ordered one fire escape on front of building.

No. 897.—One fire escape on front of building ordered.

No. 898.—Automatic gates for one elevator ordered.

No. 899.—Ordered automatic gates for one elevator.

No. 900.—Ordered automatic gates for two elevators, and new cable for rear elevator.

ACCIDENTS REPORTED DURING YEAR.

DISTRICT NO. 1.

[The number refers to inspection number in table.]

No. 1.—Jan. 9, 1896. Sam Schultz, age 48, married, laborer, employed by Traugott Schmidt & Sons, Detroit, was badly scalded on leg. Was disabled seven days, and received wages during time disabled. The accident could not have been guarded against.

No. 30.—Nov. 9, 1896. William Weller, age 24, married, feeder, employed by C. M. Rosseau & Sons, had right hand badly bruised and cut by getting caught in belt. Not yet recovered, but receives wages while disabled.

No. 38.—March, 1896. F. Copeland, age 22, single, laborer, in the employ of Alex. Gordon, was injured about head and shoulders, by falling down elevator shaft. Was disabled ten days, and received wages during time disabled. Have automatic gates.

No. 102.—Nov. 22, 1895. August Pronga, age 28, single, roofer in the employ of Hutton Bros. & Co., Detroit, fell from roof and broke right wrist. Was disabled two months, and received wages during time disabled. He also received one hundred dollars and doctor's bill paid.

No. 158.—Nov. 16, 1895. John Wagner, aged 45, married, a watchman, employed by the Improved Match Co., Detroit, was burned to death by the fire which destroyed the factory. Burial expenses paid by the family.

No. 158.—Nov. 16, 1895. R. Davis, aged 35, married, a foreman, employed by the Improved Match Co., Detroit, was burned to death by the fire which destroyed the factory. Burial expenses paid by the family.

No. 158.—Nov. 16, 1895. Agnes Yetters, aged 15, a match packer, employed by the Improved Match Co., Detroit, was burned to death by the fire which destroyed the factory. Burial expenses paid by the family.

No. 165.—January, 1896. A. E. Sauer, age 30, married, cooper, employed by William Sauer & Sons, broke left leg. Was disabled two months, and received wages during time disabled.

No. 258.—March, 1896. William Schubert, age 35, married, hand machine, in the employ of Peninsular Mfg. Co., Detroit, fell down stairs at time of fire and injured head and spine. Was disabled seven days, and did not receive wages during time disabled. Good handrail on stairs.

No. 276.—Nov. 5, 1896. James Crotty, age 35, married, grinder, employed by Detroit Twist Drill Co., Detroit, had right hand injured by the bursting of emery wheel. Was disabled seven days. Doctor and all bills paid by firm.

No. 316.—March 14, 1896. John McGuire, age 42, married, foreman in the employ of Michigan Stove Co., Detroit, bar of iron fell and injured right foot. Was disabled four weeks, and received wages during time disabled. He received four weeks' benefit from insurance company.

No. 316.—March 19, 1896. O. Van Heckie, age 23, single, moulder, employed by Michigan Stove Co., Detroit, foot badly burned by hot iron. Was disabled two weeks, and received wages during time disabled. He received insurance benefit for time disabled.

No. 316.—Feb. 20, 1896. Jerry Malo, age 25, married, moulder in the employ of Michigan Stove Co., Detroit, was burned on foot by hot iron. Was disabled five weeks, and received wages in full while disabled. He received insurance benefit for entire time.

No. 317.—March 2, 1896. August Kalha, age 47, married, machinist, employed by Ideal Mfg. Co., Detroit, lost one finger. Was disabled two weeks, and received wages during time disabled. He received an insurance.

No. 325.—Jan. 31, 1896. J. Donnovan, age 38, married, carpenter in the employ of Detroit Dry Dock Co., Detroit, head and face injured by bolt falling on him while working on scaffold. Was disabled thirty days, and did not receive wages while disabled.

No. 332.—Dec., 1895. Joseph, Ronda, age 40, married, machinist, employed by Detroit Screw Works, Detroit, had one eye destroyed by the bursting of an emery wheel. He received wages while disabled, and bills paid by firm.

No. 332.—Jan. 4, 1896. Charles Martin, age 26, single, polisher in the employ of Detroit Screw Works, had arm injured by a file striking his arm. Was disabled fourteen days, and received wages during time disabled. Doctor's bill paid by company.

No. 332.—Feb. 15, 1896. Joe Jaquin, age 16, chore boy, employed by Detroit Screw Works, cut his arm with a slotting saw. Was disabled fourteen days, and received wages during time disabled, also doctor's bill paid by firm.

No. 332.—Feb. 29, 1896. J. Ogosteingah, age 19, single, laborer, employed by Detroit Screw Works, fell in a kettle of soda water and scalded his hands. Was disabled twenty-one days, and received wages during time disabled. Doctor bills paid by company.

No. 332.—March 18, 1896. James Daly, age 15, machine boy in the employ of Detroit Screw Works, had hand injured by getting caught between belt and pulley. Was disabed three weeks, and received wages during time disabled. All doctor's bill paid by company.

No. 332.—Nov. 26, 1896. Paul Tossy, age 15, machine hand, employed by Detroit Screw Works, Detroit, had end of one finger taken off. Was disabled twenty-four days, and received wages during time disabled. Doctor's bill paid by company.

No. 334.—March 10, 1896. R. Anderson, age 30, married, laborer, employed by C. H. Little, fell from lime kiln and was killed. Burial expenses paid by firm.

No. 374.—June 12, 1896. William Heinlay, age 16, laborer in the employ of Ockford Printing Co., Detroit, fell down elevator shaft and was bruised on head and injured other ways. He receives wages in full, but not well at the date of inspection. The accident was caused by not having automatic protection for elevator.

No. 446.—May 28, 1896. Alex. Sellman, age 30, married, machine hand for Wolverine Box Co., Detroit, had one finger on right hand cut off on saw. Was disabled twenty-one days, and received wages during time disabled.

No. 475.—Jan. 22, 1896. J. Weinand, age 12, not an employé, Clough & Warren Organ Co., Detroit, fell down elevator shaft and had three ribs broken. Gates have been provided for elevator since.

No. 563.—Sept. 9, 1896. Samuel Lesster, age 40, married, foreman in the employ of Towar's Wayne County Creamery Co., Detroit, fell down elevator shaft and was badly bruised. Was disabled thirty days, and received wages while disabled. Elevator gate was open.

No. 616.—Jan. 29, 1896. William Ashdown, age 35, married, machinist, employed Michigan Malleable Iron Works, Detroit, had spine injured by loose hatchway. Still disabled, but receives wages in full.

No. 619.—July 26. 1896. Henry Marney, age 26, married, employed on running press, by Detroit Range & Boiler Co., lost one finger. Was disabled five days.

No. 641.—May 30, 1896. Joe Michiaski, age 36, married, stonecutter, employed by P. Christie & Sons, Detroit, was caught in belt and had both hands and feet crushed. Was disabled two months, and received wages while disabled.

No. 690.—March 4, 1896. J. Fleischman, age 45, married, machine hand, employed by Michigan Peninsular Car Co., Detroit, caught arm in belt and it was pulled out of socket. Wages paid during time disabled. The accident could not have been guarded against.

No. 691.—June 13, 1896. Alex. Sellman, age 30, married, foreman, employed by Frank May, Detroit, had little finger on left hand caught in gearing and cut off. Was disabled seven days, and did not receive wages while disabled. He admitted it was his own carelessness.

No. 709.—June, 1896. C. Frayer, age, 21, single, miller, employed in David Stott's flouring mills, lost left hand by having it caught in roller. Was disabled three months, and received wages during time disabled.

No. 750.—May 15, 1896. Robert Stewart, age 30, married, engineer, Goebel's Brewing Co., Detroit, had right hand badly crushed in machinery. Was disabled two weeks, and received wages during time disabled. The accident could not have been guarded against.

No. 770.—June 9, 1896. Charles Smith, age 26, married, a grinder, employed by the Detroit White Lead Works, Detroit, caught his fingers in a cog wheel and had the ends of two of them smashed. Was partially disabled for three months, during which time his wages were paid.

No. 780.—July 3, 1896. August Rambo, age 42, married, machine hand, employed by C. D. Widman & Co., Detroit, was cut on forefinger. Was disabled twenty-one days, and received $22 of salary and doctor's bill paid.

No. 780.—Aug. 3, 1896. H. Gayhord, age 20, single, machine hand, employed by C. D. Widman & Co., Detroit, lost one finger. Was disabled five days, and received wages during time disabled.

No. 788.—April 22, 1896. Frank Milka, age 50, married, laborer in the employ of Michigan Peninsular Co., Detroit, was caught in elevator and had leg broken twice, two ribs broken, and injured on head. Was disabled three months, and received wages during time disabled. Elevator was equipped with automatic gates.

No. 789.—Date not given. 1896. John Carl, age 21, single, woodworker, employed by Murphy, Wasey & Co., had fingers bruised. Was disabled three weeks, and received wages while disabled.

No. 789.—Date not given. 1896. Anthony Holz, age 41, married, driver in the employ of Murphy, Wasey & Co., Detroit, was injured about head and shoulders. Was disabled three weeks, and received wages while disabled.

No. 789.—Date not given. 1896. John Bachofski, age 18, employed at cutting die for Murphy, Wasey & Co., Detroit, lost two fingers by getting under die. Was disabled six weeks, and received wages during time disabled.

No. 789.—Date not given. 1896. Tony Brown, age 14, helper, in the employ of Murphy, Wasey & Co., Detroit, lost two fingers on cut off saw. Was disabled four weeks, and received wages during time disabled.

No. 794.—Sept. 1896. Edward Roth, age 17, helper, employed by Craddock Mfg. Co., Detroit, was killed by getting clothing caught on main shaft.

No. 798.—June 4, 1896. Ed. Wagner, age 30, married, machinist, in the employ of American Radiator Co., Detroit, lost one finger. Was disabled fourteen days, and received wages during time disabled. Could not have been guarded against.

No. 798.—July 15, 1896. F. Junsk, age 28, married, teamster, employed by American Radiator Co., Detroit; had leg broken; was disabled nine weeks, and received wages during time disabled; doctor's bill paid by company.

No 800.—Feb. 5, 1896. Joe Green, age 33, married, moulder, employed by Leland & Faulconer Mfg. Co., Detroit, had foot badly burned, by spilling iron while moulding. Was disabled two days, and received wages while disabled.

No. 800.—March 10, 1896. S. Bryan Green, age 23, single; clipper, employed by Leland & Faulconer Mfg. Co., Detroit, had finger bruised while chipping castings; was disabled one week; he carried an insurance.

No. 800.—June 22, 1896. Ben Gomersall, age 38, married; superintendent for Leland & Faulconer Mfg. Co., Detroit; was badly burned by spurting of hot iron from cupola; was disabled two weeks; he carried an insurance.

No. 800.—June 24, 1896. Reuben Reed, age 26, single, machinist, in employ of Leland & Faulconer Mfg. Co., Detroit; had finger caught in machine and badly bruised; was disabled two weeks; he carried an insurance.

No. 838.—June 27, 1896. Jacob Gafaky, age 18, laborer, in the employ of John J. Bagley, caught in elevator gate and badly injured on head. Was disabled twenty-one days, and received wages in full, also hospital and doctor bills paid.

No. 856.—Sept. 5, 1896. L. Winters, age 45, married, cabinet maker, in the employ of John Phillips, Detroit, lost right thumb by his apron catching in revolving shaft. Was disabled five weeks and received wages during time disabled. The accident could not have been guarded against.

No. 861.—Feb. 8, 1896. E. Hohlfeldt, age 25, married, machinist, in the employ of American Radiator Co., Detroit, was killed by the bursting of emery wheel. Burial expenses paid by company.

No. 861.—April 5, 1896. A. Basman, age 36, married, tester, employed by American Radiator Co., Detroit, had leg broken by radiator falling on it. Was disabled six weeks, and received $34.50, and doctor's bill paid by firm.

No. 861.—May 10, 1896. Frank Miller, age 38, married, laborer, in the employ of American Radiator Co., Detroit, was struck with wrench and had leg broken. Was disabled two months, and received wages amounting to $72.40. Also hospital bill paid.

No. 861.—June 20, 1896. A. Zaff, age 45, married, laborer, employed by American Radiator Co., Detroit, fell off pile of iron and broke his leg. Was disabled two months, and received $38.50, amount of wages during time disabled. Also hospital bill amounting to $56.00.

No. 862.—June 29, 1896. F. Gizybawski, age 44, married, laborer, in the employ of Russell Wheel Foundry Co., Detroit, was caught on machinery and injured. Was disabled two months, and received wages during time disabled.

No. 868—Feb. 8, 1896. Elmora Allen, age 17, machine hand, employed by Empire Fibre Co., Detroit, had left hand crushed and burned getting it caught in roller. Was disabled four months and received wages while disabled.

No. 878.—Oct. 1, 1896. Fred Steel, age 20, single, a laborer, employed by Clark Can Co., Detroit, had finger injured by accidentally putting it in a machine. Was disabled twenty-one days and received wages and benefits while disabled.

No. 880.—Feb. 24, 1896. William Kausenaw, age 17, not empolyed, fell down the elevator shaft at Pingree & Smith's and was badly injured on head. Received no pay or benefit and has not yet recovered. He mistook the elevator shaft for stairs.

No. 880.—Oct. 21, 1896. L. Kretoch, age 17, employed at elevator for Pingree & Smith, lost his balance and fell from elevator; arm broken in two places; had not recovered at date of report; wages and benefits were paid by the company.

No. 889.—July 4, 1896. Aug. Schneider, age 46, married, a laborer in the employ of the Detroit Soap Co.; fell over some rubbish and broke three ribs; was disabled 24 days and received pay during the time disabled.

SECOND DISTRICT.

GEO. E. GUNN, *Deputy Inspector.*

SUMMARY OF WORK IN SECOND INSPECTION DISTRICT.

OFFICE OF DEPUTY INSPECTOR,
Charlotte, Dec. 4, 1896.

HON. C. H. MORSE, *Commissioner of Labor, Lansing, Mich.:*

DEAR SIR—In accordance with your instructions, I most respectfully submit the following report of my work as Deputy Inspector of the second inspection district of Michigan, showing in tabulated form the work done each year since the factory inspection law went into effect, September 1, 1893, followed by a short explanation of my work for 1896:

Table showing factory inspection in second district since September 1, 1893.

Kind of changes ordered.	1893.		1894.		1895.		1896.	
	No. of changes ordered.	No. of orders complied with	No. of changes ordered.	No. of orders complied with.	No. of changes ordered.	No. of orders complied with.	No. of changes ordered.	No. of orders complied with.
Belts ordered guarded	286	136	55	39	74	56	47	43
Elevators ordered protected	54	38	76	45	78	63	40	31
Fire escapes ordered	4	2	6	4	13	11	11	7
Machines ordered guarded	107	55	82	67	80	59	71	69
Children under fourteen ordered out	11	11	17	17	19	19	8	8
Exhaust fans ordered	4	2	11	7	17	12	8	5
Places where statements were ordered	4	4	16	16	16	16	5	3
Miscellaneous orders made	97	41	55	41	31	31	72	57
Whole number	567	289	318	236	328	267	262	223

Whole number of factories inspected in 1893	418
Whole number of factories visited in 1893	25
Whole number of factories inspected in 1894	284
Whole number of factories revisited in 1894	55
Whole number of factories inspected in 1895	615

Whole number of factories revisited in 1895	136
Whole number of factories inspected in 1896	628
Whole number of factories revisited in 1896	142
Whole number of inspections made since September 1, 1893	1,945
Whole number of revisits made since September 1, 1893	358
Whole number of changes ordered since September 1, 1893	1,472
Whole number of orders complied with since September 1, 1893	1,014

The work of 1896 shows 262 changes ordered and 223 compliances, leaving 39, ten of which were made where business has been suspended since inspection, and the other 29 at places that were idle when I revisited or at places recently inspected. Greater success has been attained in the work of this year than in any of the preceding ones, due largely to the system adopted of sending written notices to the owners of establishments where changes were required.

By the prompt compliance with the inspector's orders, and in satisfying both employer and employé, as well as the public, which is beginning to realize the need of thorough inspection of factories, since it has almost entirely eliminated child labor, and by the protection of elevators, belts, and machinery has greatly reduced the number of accidents.

But three prosecutions have been made in my district this year for violation of the law, viz.: Geo. T. Commings, of St. Joseph, for employing children who were under fourteen years of age, in a basket factory; Chas. Donohue, of Trenton, for employing children under fourteen years of age; and J. E. Wolf, of Springwells, for the same offense. Commings plead guilty and was fined, Donohue plead not guilty, was tried and convicted, and Wolf plead not guilty, was tried and acquitted, as the child's father who was employed by Wolf testified in court that his son only passed the time with him and was not employed by Wolf. However, at the time I inspected the brick yard I found the child piling brick, and got a sworn statement from his father, stating that the boy had worked several weeks at the same task. The law says that "any person who suffers or permits any child to be employed in violation of its provisions shall be deemed guilty of a misdemeanor," and Wolf had a positive knowledge that the men he employed to work at "piece work" were in the habit of bringing their families and with their help accomplishing the work of two days in one. Experience has taught me that it is impossible to convict all technical cases of violation of the child labor clause in our State law. But the inspectors can make it so disagreeable for those who do violate it, that it may be classed among the laws which are enforced.

Steam boiler explosions are among the most terrible and disastrous of the many kinds of accidents, and I believe the factory inspection law should embrace the inspection of boilers, and provide for a suitable number of inspectors to make at least two internal inspections each year of all boilers in manufacturing establishments in the State.

Sad as it is when those connected with boilers and who gain their livelihood from working them are injured, it is even more sad when outsiders who have no interest in their use or control over their management are victimized by their explosion. To my certain knowledge there are boilers in my territory that are not properly cleaned from the time they are put into service until it is absolutely necessary to have them repaired by a boiler maker, who finds by the negligence of the man in charge that a greasy incrustation or some mineral deposit has prevented the water from touching the boiler, and by overheating the fire surface has ruptured the shell, which is the cause of a large number of boiler explosions.

Steam gauges should be thoroughly tested, safety valves kept in good condition, feed pipes should be free from scale, injectors and pumps kept in good repair. In fact too much cannot be said regarding the necessity of boiler inspection, and for the enforcement of the present factory inspection law. While some amendments might be made which would be of great benefit to the inspectors in their work, at present there is satisfactory evidence of the work that has been done in every manufacturing town in the State.

Very respectfully yours,
GEO. E. GUNN,
Deputy Factory Inspector.

Inspection book No. 1. **TABLE No. 2.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
1	Jan. 20	Vermontville	F. P. Towne	Lumber	idle	......
2	" 20	"	Fuller Bros.	"	"	......
3	" 21	Nashville	Lents Table Co.	Tables	run.	full
4	" 21	"	H. R. Dickinson	Lumber, flour and feed	idle	......
5	" 22	Hastings	Hastings Table Co.	Tables	run.	full
6	" 22	"	Hastings Wool Boot Co.	Wool boots	idle	......
7	" 22	"	Michigan Whip Co.	Whips	run.	full
8	" 22	"	Ed. Powers	Cigars	"	"
9	" 22	"	Hastings Roller Mills	Flour and feed	"	"
10	" 22	"	Hastings Engine and Iron W'ks.	Machinery	"	part
11	" 23	"	Bentley, Tomlinson & Rider	Hose reels	"	"
12	" 23	"	Hastings Furniture Co.	Furniture	idle	......
13	" 23	"	Lewek & Beamer	Cigars	run.	full
14	" 23	"	Hastings Electric Light Co.	Electricity	"	"
15	" 24	Middleville	Keeler Bros. Co.	Furniture trimmings	"	"
16	" 24	"	T. D. French & Son	Flour and feed	"	"
17	" 27	Battle Creek	Duplex Printing Press Co.	Printing presses	idle	......
18	" 27	"	Union Steam Pump Co.	Steam pumps	run.	full
19	" 27	"	Wm. A Jacobs	Cigars	"	"
20	" 28	"	A. M. Minty	"	"	"
21	" 28	"	Wm. C. Gage & Son	Job printing	"	"
22	" 28	"	L. B. Clapp	Sash, doors and blinds	"	"
23	" 28	"	Battle Creek Steam Pump Co.	Steam pumps	"	"
24	" 28	"	Chicago & G. T. R'y Shops	Machinery	"	"
25	" 29	"	Nichols & Shepard Co.	Threshing machines	"	part
26	" 29	"	L. Van Praggh	Cigars	"	full
27	" 29	"	Battle Creek Electric Co.	Electric lights	"	"
28	" 29	"	Metal Back Album Co.	Albums	"	part
29	" 29	"	City Steam Laundry	Laundry work	"	full
30	" 29	"	Review and Herald Pub. Co	Job printing	"	"
31	" 30	"	Knight & Beach	Sash, doors and blinds	"	part
32	" 30	"	Battle Creek Food Co.	Caramel cereal	"	full
33	" 30	"	Advance Thresher Co.	Thresh. mach. & engines	"	part
34	" 30	"	Battle Creek San. H'lth Food Co.	Baked goods	"	full
35	" 30	"	Advance Foundry	Castings	"	"
36	" 31	"	Battle Creek Furniture Co.	Furniture	"	part
37	" 31	"	Mason, Rathburn & Co.	Sash, doors and blinds	"	"
38	" 31	"	Morgan M. Lewis	Building material	"	"
39	" 31	"	John Brennan & Co.	Boilers	"	full
40	" 31	"	Michigan Scoop Co.	Scoops	"	part
41	" 31	"	Eureka Loom Co.	Weaving looms	"	"
42	Feb. 3	"	Battle Creek Implement Co.	Wagons	"	"
43	" 3	"	Angell Bros.	Sash, doors and blinds	"	full
44	" 3	"	G. A. Du Bois	Sort rags	"	"
45	" 3	"	Daily Moon	Newspaper	"	"
46	" 3	"	Meek's Palace Laundry	Laundry work	"	"
47	" 3	"	Wheelock's Mills	Flour and feed	"	"
48	" 4	Pine Grove	Everest & Co.	Lumber and boxes	"	"
49	" 4	Gobleville	James Clement	Lumber	idle	......
50	" 4	Bloomingd'le	E. J. Merrifield	"	"	......

District No. 2. *Geo. E. Gunn, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the ages of 14 and 16 employed.	Are registers and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	..	10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	1
60		8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	2
60	60	40	40	----	$1,200	----	----	----	10	60	yes	yes	yes	yes	no	‡	----	----	yes	yes	-	----	3
60	..	8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	4
60	60	55	46	----	1,750	----	----	----	10	60	yes	yes	yes	yes	no	yes	yes	yes	no	yes	- -	1	5
66	..	90	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	6
60	60	40	7	5	1,000	----	----	----	10	60	yes	----	no	yes	no	‡	yes	yes	----	yes	yes	----	7
48	48	8	1	1	75	----	----	----	8	60	----	----	yes	"	"	‡	----	----	----	"	"	----	8
72	72	3	3	----	----	----	----	----	----	60	yes	----	"	"	"	‡	yes	no	----	"	----	----	9
60	48	16	8	----	325	----	----	----	10	60	"	----	----	"	"	‡	"	yes	----	"	----	----	10
60	48	30	12	----	300	----	----	----	10	----	"	no	yes	"	"	‡	"	no	----	"	----	----	11
60	..	125	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	12
48	48	3	3	----	120	----	----	----	8	60	----	----	----	yes	no	‡	----	----	----	yes	----	----	13
60	60	4	4	----	160	----	----	----	10	60	yes	----	yes	"	"	‡	yes	no	----	"	----	----	14
60	60	50	37	5	1,325	----	----	----	10	60	----	----	"	"	"	‡	"	yes	yes	"	yes	----	15
*	*	8	8	----	350	----	----	----	10	60	----	----	"	"	"	‡	"	no	----	"	----	----	16
60	..	150	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	17
60	60	45	34	----	1,725	----	----	----	10	60	yes	----	yes	yes	no	‡	yes	yes	no	yes	----	----	18
48	48	5	5	----	135	----	----	----	8	60	----	----	----	"	"	‡	----	----	----	"	----	----	19
48	48	25	8	3	440	----	----	----	8	60	----	----	yes	"	"	‡	----	----	----	"	yes	----	20
60	60	50	35	10	1,520	----	----	----	10	60	yes	yes	no	"	"	‡	yes	yes	----	"	"	----	21
60	60	12	7	----	325	----	----	----	10	60	"	----	yes	"	"	‡	"	"	----	"	----	----	22
60	60	75	75	----	4,335	----	----	----	10	60	"	yes	"	"	"	‡	"	no	no	"	yes	----	23
60	60	213	213	----	10,000	----	----	----	10	60	"	----	----	"	"	‡	"	"	yes	"	"	----	24
60	48	375	325	----	13,000	----	----	----	10	60	"	yes	yes	"	"	‡	"	"	"	"	"	----	25
48	48	6	2	----	80	----	----	----	8	60	----	----	"	"	"	no	----	----	----	"	"	----	26
72	72	2	2	----	90	----	----	----	12	60	----	----	----	"	"	‡	yes	no	----	"	"	----	27
60	54	40	9	2	350	----	----	----	10	60	yes	yes	yes	"	"	‡	"	yes	----	"	yes	----	28
60	60	17	4	6	260	----	----	----	10	60	"	----	"	"	"	‡	"	"	----	no	no	----	29
60	60	325	155	100	7,800	----	----	----	10	60	"	yes	"	"	"	yes	"	"	----	yes	yes	----	30
60	48	8	1	----	45	----	----	----	10	60	----	----	"	"	"	‡	"	"	----	"	- --	----	31
60	60	6	3	3	440	----	----	----	10	60	yes	no	"	"	"	‡	"	no	----	"	yes	----	32
60	51	425	359	----	16,500	----	----	----	10	60	"	yes	"	"	"	‡	"	yes	no	"	----	----	33
60	60	50	43	7	1,400	----	----	----	10	60	"	"	"	"	"	‡	"	no	----	"	yes	----	34
60	60	90	90	----	†	----	----	----	10	60	"	----	----	"	"	‡	"	yes	yes	"	----	----	35
60	48	20	10	----	400	----	----	----	10	60	"	----	no	"	"	‡	no	no	----	"	----	----	36
60	54	20	10	----	450	----	----	----	10	60	"	----	----	"	"	‡	yes	yes	----	"	----	----	37
60	45	6	3	----	120	----	----	----	10	60	"	----	----	"	"	‡	"	"	----	"	----	----	38
60	60	60	35	----	1,300	----	----	----	10	60	"	----	----	"	"	‡	"	"	----	"	----	----	39
60	54	6	2	1	120	----	----	----	10	60	"	----	yes	"	"	‡	"	"	----	"	yes	----	40
60	57	6	4	----	190	----	----	----	10	60	"	----	----	"	"	‡	"	"	----	"	----	----	41
60	48	44	22	----	875	----	----	----	10	60	"	----	yes	"	"	‡	"	no	----	"	----	----	42
60	60	5	3	----	120	----	----	----	10	60	"	no	"	"	"	‡	"	yes	----	"	----	1	43
60	60	20	3	10	390	----	----	----	10	60	----	"	"	"	"	‡	----	----	----	"	yes	----	44
60	60	12	8	4	560	----	----	----	10	60	----	----	no	no	"	‡	yes	yes	----	"	"	----	45
60	60	12	6	6	326	----	----	----	10	60	yes	----	----	yes	"	‡	"	----	----	"	no	----	46
72	72	3	3	----	105	----	----	----	----	60	--	----	no	"	"	‡	"	no	----	"	----	----	47
60	60	20	12	----	400	----	----	----	10	60	yes	----	"	"	"	‡	no	"	----	"	----	----	48
60	..	8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	49
60	..	10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	50

*** 144-running night and day. † Pay roll was given with Advance Thresher Co. ‡ None required.**

Inspection book No. 2.

TABLE No. 2.—CONTINUED.—

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
51	Feb. 4	G'd Junction	Wm. Erkenbeck	Lumber	run.	part
52	" 4	"	The Gospel Trumpet Pub. Co.	Printed matter	"	full
53	" 5	South Haven	South Haven Roller Mills	Flour and feed	"	"
54	" 5	"	Geo. H. Myhan & Co.	Sole leather	"	"
55	" 5	"	J. C. Worthington	Dressed lumber	"	part
56	" 5	"	J. C. Randall	Sash, doors and blinds	"	full
57	" 5	"	Pierce-Williams Co.	Fruit packages	idle	
58	" 6	"	Wm. Mackey & Son	Stoves	run.	full
59	" 6	"	Winkel Bros.	Dressed lumber	"	part
60	" 6	"	A. M. Prouty	Staves and heading	idle	
61	" 6	Bangor	R. C. Nyman	Lumber	"	
62	" 7	Hartford	A. H. Young & Co.	Heading	run.	full
63	" 7	"	Chas. Leach	Lumber	idle	
64	" 7	"	Walker & Son	"	"	
65	" 7	"	Chicago Last & Die Co.	Boot lasts	"	
66	" 7	Watervliet	Syms & Dudley	Paper	run.	full
67	" 7	"	H. Pierce & Son	Lumber	"	"
68	" 10	St. Joseph	Mullen Bros. Paper Co.	Paper	"	"
69	" 10	"	St. Joseph Wood Works	Dressed lumber	"	"
70	" 10	"	Cooper, Wells & Co.	Knit goods	"	"
71	" 10	"	W. A. Preston	Sash, doors and blinds	idle	
72	" 10	"	St. Joseph Iron Works	Machinery	run.	part
73	" 10	"	Wells, Higman & Co.	Fruit packages	idle	
74	" 11	"	S. J. & B. H. Elec. R'y & Light Co.	Electric power	run.	full
75	" 11	Bent'n H'rb'r	Phil. Russell	Cigars	"	"
76	" 11	St. Joseph	The Evening Press	Newspapers	"	"
77	" 11	Bent'n H'rb'r	Spencer & Barnes	Furniture	"	"
78	" 11	"	Buss Machine Works	Machinery	idle	
79	" 11	"	City Steam Laundry	Laundry work	run.	full
80	" 12	"	The Evening News	Newspapers	"	"
81	" 12	"	Daily Palladium	"	"	"
82	" 12	"	Fontaine Milling Co.	Flour and feed	"	part
83	" 12	"	J. B. Graves & Co.	Dressed lumber	idle	
84	" 12	"	E. W. Heath	Boats	run.	full
85	" 12	"	Thayer & Co.	Fruit packages	"	part
86	" 13	"	J. M. Spink	Sash, doors and blinds	idle	
87	" 13	"	Colby, Hinkley & Co.	Fruit packages	run.	part
88	" 13	"	A. Bauschke & Bros.	Wagons	"	full
89	" 13	"	John Allmendinger	Lumber	"	"
90	" 17	Kalamazoo	Lilies Cigar Co.	Cigars	"	"
91	" 17	"	Globe Casket Mfg. Co.	Caskets	"	"
92	" 18	"	Humphrey Mfg. & Plating Co.	Machinery	"	"
93	" 18	"	California Track Harrow Co.	Harrows	"	"
94	" 18	"	Thomas Clarage & Son	Machinery	"	"
95	" 18	"	Hall Bros. & Co.	Pharmaceutical goods	"	"
96	" 18	"	Benj. Cleenewerck	Cigars	"	"
97	" 19	"	Kalamazoo Pant & Overall Co.	Pants and overalls	"	"
98	" 19	"	Ihling Bros. & Everard	Blank books	"	"
99	" 19	"	The Henderson-Ames Co.	Military & band supplies	"	"
100	" 19	"	The Hanselman Candy Co.	Candy	"	"

District No. 2. *Geo. E. Gunn, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	48	5	3	....	$78	....	....	......	10	60	yes	....	....	yes	no	†	yes	no	....	yes	....	....	51
60	60	20	13	7	*	....	....	......	10	60	"	....	yes	"	"	†	"	yes	....	"	yes	....	52
66	66	4	3	....	105	....	....	......	11	60	"	....	no	"	"	†	"	"	....	"	....	....	53
60	60	20	14	....	600	....	....	......	10	60	"	....	yes	"	"	†	"	"	....	"	....	....	54
60	48	5	1	....	40	....	....	......	10	60	"	....	"	"	"	†	"	"	....	"	....	....	55
60	60	5	2	....	65	....	....	......	10	60	"	....	....	"	"	†	"	"	....	"	....	....	56
60	..	100	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	57
60	60	9	9	....	850	....	....	......	10	60	yes	....	....	yes	no	†	yes	yes	no	yes	....	....	58
60	48	4	3	....	105	....	....	......	10	60	"	....	....	"	"	†	"	no	....	"	....	....	59
60	..	25	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	60
60	..	6	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	61
60	60	12	7	....	240	....	....	......	10	60	yes	....	....	yes	no	†	yes	yes	....	yes	....	....	62
60	..	8	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	63
60	..	10	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	64
60	..	7	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	65
60	60	109	71	38	3,400	....	....	......	10	60	yes	yes	no	yes	no	†	yes	no	yes	yes	yes	....	66
60	60	5	5	....	160	....	....	......	10	60	"	....	....	"	"	†	"	yes	....	"	....	....	67
72	72	25	25	....	866	....	....	......	10	60	no	yes	yes	"	"	†	"	"	....	"	....	....	68
60	60	2	2	...	70	....	....	......	10	60	yes	....	....	"	"	†	"	"	....	"	....	....	69
60	60	235	50	185	5,500	....	6	yes	10	60	"	....	no	no	"	†	"	"	....	"	yes	....	70
60	..	28	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	71
60	54	30	30	....	1,500	....	....	......	10	60	yes	....	....	yes	no	†	yes	yes	....	yes	....	....	72
60	..	20	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	73
72	72	8	7	....	345	....	....	......	....	60	yes	....	yes	yes	no	†	yes	no	....	yes	....	....	74
60	60	5	2	....	75	....	....	......	10	60	....	....	"	"	"	†	....	....	....	"	....	....	75
60	60	8	5	3	215	....	....	......	10	60	yes	....	"	"	"	†	yes	yes	....	"	yes	....	76
60	60	130	130	....	6,500	....	....	......	....	....	"	no	no	"	"	†	no	no	yes	"	....	1	77
60	..	125	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	78
60	60	15	4	6	260	....	....	......	10	60	yes	....	....	yes	no	†	yes	yes	....	yes	no	....	79
60	60	12	8	4	438	....	....	......	10	60	....	....	....	"	"	†	"	"	....	no	"	....	80
60	60	14	7	7	640	....	....	......	10	60	....	...	yes	"	"	†	"	"	....	yes	yes	....	81
60	36	5	5	....	175	....	....	......	10	60	yes	....	"	"	"	†	"	"	yes	"	....	....	82
60	..	25	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	83
60	60	85	28	....	1,200	....	....	......	....	60	yes	....	yes	yes	no	†	yes	yes	....	yes	....	....	84
60	54	50	6	....	200	....	....	......	10	60	"	yes	"	"	"	†	"	"	....	"	....	....	85
60	..	6	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	86
60	50	40	14	....	420	....	....	......	10	60	yes	yes	yes	yes	no	†	yes	yes	.. .	yes	....	....	87
60	60	12	6	....	216	....	....	......	10	60	....	no	"	"	"	†	....	....	....	"	....	....	88
60	60	10	6	....	200	....	....	......	10	60	yes	....	"	"	"	†	yes	yes	....	"	....	....	89
48	48	22	22	....	1,700	....	....	......	8	60	"	no	"	"	"	no	....	....	....	"	....	....	90
60	60	120	85	15	4,000	....	....	......	10	60	"	yes	"	"	"	"	yes	yes	....	"	yes	....	91
60	60	30	20	....	1,000	....	....	......	10	60	"	....	no	"	"	†	"	no	yes	"	....	....	92
60	60	15	4	....	160	....	....	......	10	60	"	yes	yes	"	"	†	"	"	....	"	....	....	93
60	60	....	35	....	1,200	....	....	......	10	60	"	....	"	"	"	†	"	"	....	"	....	....	94
60	60	....	14	1	500	....	1	yes	10	60	"	no	"	"	"	†	"	yes	....	"	yes	....	95
48	48	7	7	....	285	....	....	......	8	60	....	....	....	"	"	†	....	....	....	"	....	....	96
60	60	125	15	110	2,800	....	....	......	10	60	yes	no	no	no	"	†	yes	yes	....	"	yes	....	97
60	60	90	70	20	2,825	....	2	yes	10	60	"	yes	yes	yes	"	yes	"	"	....	"	"	....	98
60	60	....	45	86	3,900	....	....	......	10	60	"	"	"	"	"	"	"	"	....	"	"	....	99
60	60	25	6	6	400	....	....	......	10	60	....	no	"	"	"	†	....	....	....	"	"	....	100

* Employes work for board and clothing. † None required.

Inspection book No. 3.

TABLE No. 2.—Continued.—

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
101	Feb. 20	Kalamazoo	The Phelps & Bigelow W'd M'l Co	Wind mills	idle	......
102	" 20	"	S. Salomon & Co.	Pants and overalls	run.	full
103	" 20	"	Specialty Mfg. Co.	Slot machines	"	"
104	" 20	"	Harrow Spring Co.	Harrow springs	"	"
105	" 20	"	L. Jay Everett	Wood work	"	"
106	" 21	"	Banner Laundry	Laundry work	"	"
107	" 21	"	Clark & Dutton	Machinery	"	"
108	" 21	"	Cornell & Co.	Carriages	idle	......
109	" 21	"	Featherbone Corset Co.	Corsets	run.	part
110	" 24	"	D. Burrell & Son	Wagons	"	"
111	" 24	"	Remington & Ford	General wood work	"	full
112	" 24	"	F. C. Cooper	Rugs	"	part
113	" 24	"	Wm. E. Hill & Co	Saw mill	"	"
114	" 24	"	Kal. Foundry and Machine Co.	Machinery	"	full
115	" 25	"	The American Playing Card Co.	Playing cards	"	part
116	" 25	"	The Upjohn Pill and Granule Co.	Pills and granules	"	full
117	" 26	"	Kalamazoo Spring and Axle Co.	Springs and axles	"	"
118	" 25	"	North & Coon	Sash, doors and blinds	"	part
119	" 25	"	Wm. H. Gibson	Elevators	idle	......
120	" 26	"	John P. Windoes	Gloves and mittens	"	......
121	" 26	"	Van Bochove & Son	Sash, doors and blinds	run.	part
122	" 26	"	Kalamazoo Sled Co.	Hand sleds	"	full
123	" 26	"	Kal. Boiler and Engine Works	Boilers and engines	"	"
124	" 26	"	The Lull & Skinner Co.	Harrows and carriages.	"	"
125	" 27	"	The Daily News	Newspapers	"	"
126	" 27	"	Kalamazoo Publishing Co.	Blank books	"	"
127	" 27	"	The Mirror	Newspapers	"	"
128	" 27	"	Kal. R. R. Velocipede & Car Co.	R. R. velocipedes	"	"
129	" 27	"	Kalamazoo Interior Finish Co.	Interior wood finish	"	"
130	" 28	"	Dewing & Sons	Sash, doors and blinks	"	"
131	" 28	"	Winans' Buggy Co	Buggies	"	part
132	" 28	"	Mich. Buggy Co.	"	"	full
133	" 28	"	American Carriage Co.	Carriages	"	part
134	" 28	"	Kalamazoo Telegraph	Newspapers	"	full
135	Mar. 2	"	Merrill Milling Co.	Flour and feed	"	part
136	" 2	"	Kalamazoo Wagon Co.	Carriages	"	"
137	" 2	"	Williams Mfg. Co.	Water tanks	idle	......
138	" 2	"	French Garment Co.	Ladies' skirts	run.	full
139	" 2	"	D. C. & H. C. Reed & Co.	Harrows	"	"
140	" 3	"	Kalamazoo Casket Co.	Caskets	"	"
141	" 3	"	Standard Wheel Co.	Buggy wheels	"	part
142	" 3	"	Cone Coupler Carriage Co.	Carriages	"	"
143	" 3	"	St. Johns Plow Co.	Plows	"	"
144	" 3	"	American Washboard Co.	Wash boards	idle	......
145	" 4	"	Asylum for the Insane	Baked goods, electric light & laundry work.	run.	full
146	" 4	"	Excelsior Steam Laundry	Laundry work	"	"
147	" 4	"	H. B. Sortor	Edge tools	"	"
148	" 4	"	Kalamazoo Paper Co.	Book paper	"	"
149	" 5	"	Botsford Paper Mill Co.	" "	"	"
150	" 5	"	Wilson Foundry and Forge Co.	Castings	"	"

District No. 2. *Geo. E. Gunn, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	--	40	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	101
60	60	100	5	35	$1,200	----	----	------	10	60	yes	no	yes	yes	no	‡	yes	yes	yes	yes	yes	----	102
60	60	4	4	----	180	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	"	----	----	103
60	60	100	40	----	1,700	----	2	yes	10	60	"	----	----	"	"	‡	"	"	----	"	----	----	104
60	60	4	4	----	208	----	----	------	10	60	"	----	----	"	"	‡	"	"	----	"	----	----	105
60	60	25	5	7	360	----	----	------	10	----	"	----	no	"	"	‡	"	no	----	"	yes	----	106
60	60	60	50	----	1,850	----	----	------	10	60	"	----	yes	"	"	‡	"	yes	----	"	----	----	107
60	--	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	108
60	48	240	25	170	3,900	----	----	------	10	60	yes	yes	yes	yes	no	no	yes	yes	----	yes	yes	----	109
60	48	30	12	----	400	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	"	----	----	110
60	60	20	20	----	850	----	----	------	10	†30	"	no	"	"	"	‡	"	----	----	"	----	----	111
60	48	6	----	2	37	----	----	------	10	60	"	----	"	"	"	‡	"	yes	----	"	yes	----	112
60	54	60	40	----	1,500	----	----	------	10	60	"	yes	"	"	"	‡	"	"	----	"	----	----	113
60	60	40	24	----	1,000	----	----	------	10	60	"	----	----	"	"	‡	"	"	----	"	----	----	114
60	48	135	25	75	1,525	----	2	yes	10	60	"	yes	yes	"	"	yes	"	"	----	"	yes	----	115
60	60	50	25	25	1,625	----	----	------	10	60	"	"	"	"	"	"	"	"	----	"	"	----	116
60	60	111	111	----	2,975	----	2	yes	10	50	"	----	"	"	"	‡	"	"	----	"	----	----	117
60	48	40	22	----	1,300	----	----	------	10	60	"	----	"	"	"	‡	"	"	yes	"	----	----	118
60	--	8	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	119
60	--	10	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	120
60	48	18	14	----	560	----	----	------	10	60	yes	----	yes	yes	no	‡	yes	yes	----	yes	----	----	121
60	60	80	35	2	1,550	----	----	------	10	†35	"	yes	"	"	"	‡	"	"	----	"	yes	1	122
60	60	65	60	1	2,170	----	----	------	10	45	"	----	----	"	"	‡	"	"	----	"	"	1	123
60	60	110	90	5	4,000	----	----	------	----	60	"	----	yes	"	"	‡	"	"	----	"	"	----	124
60	60	18	15	3	720	----	----	------	10	60	----	----	"	"	"	‡	"	"	----	"	"	----	125
60	60	70	60	10	2,625	----	----	------	10	60	yes	----	"	"	"	‡	"	"	----	"	"	----	126
60	60	4	4	----	158	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	"	----	----	127
60	60	50	25	1	1,200	----	----	------	10	60	"	no	"	"	"	‡	"	no	----	"	yes	----	128
60	60	18	18	----	800	----	----	------	10	60	----	----	"	"	"	‡	"	yes	----	"	----	----	129
60	60	200	100	----	4,000	1	2	no	10	†30	yes	no	"	"	yes	‡	"	no	yes	"	----	----	130
60	54	60	15	----	540	----	----	------	10	60	"	yes	"	"	no	‡	"	yes	----	"	----	----	131
60	60	300	242	8	7,000	----	----	------	10	60	"	"	"	"	"	yes	"	"	----	"	yes	----	132
60	54	50	48	2	2,100	----	----	------	10	60	"	no	"	"	"	‡	"	"	----	"	"	----	133
60	60	25	20	3	1,000	----	----	------	10	60	----	----	"	"	"	‡	"	"	----	"	"	----	134
*	66	9	6	----	240	----	----	------	10	60	yes	----	"	"	"	‡	"	no	----	"	----	----	135
60	54	75	73	2	3,500	----	----	------	10	60	"	yes	"	"	"	‡	"	yes	----	"	yes	----	136
60	--	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	137
60	60	14	----	8	300	----	----	------	10	60	----	----	yes	yes	no	‡	----	----	----	yes	yes	----	138
60	60	20	10	----	390	----	----	------	10	60	yes	----	----	"	"	‡	yes	yes	----	"	----	----	139
60	60	50	33	3	1,300	----	----	------	10	50	"	----	yes	"	"	‡	"	"	----	"	yes	----	140
60	48	250	230	----	7,000	----	----	------	10	60	"	yes	"	"	"	‡	"	"	yes	"	----	----	141
60	48	50	9	2	400	----	----	------	10	60	"	"	"	"	"	yes	"	"	----	"	yes	----	142
60	54	----	8	1	335	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	"	"	----	143
60	--	95	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	144
60	60	----	----	----	------	----	----	------	10	60	yes	no	yes	yes	no	‡	yes	no	yes	yes	----	----	145
60	60	10	3	7	250	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	no	no	----	146
60	60	8	2	----	80	----	----	------	10	60	"	----	----	"	"	‡	"	yes	----	yes	----	----	147
*	*	110	57	53	4,000	----	3	yes	10	60	"	----	yes	"	"	‡	"	no	yes	"	yes	----	148
*	*	100	50	20	2,600	----	----	------	10	60	"	no	"	"	"	yes	"	yes	----	"	"	----	149
60	60	12	9	----	400	----	----	------	10	60	"	----	----	"	"	‡	"	"	----	"	----	----	150

*** 144–running night and day.** **† Permit given by inspectors.** **‡ None required.**

Inspection book No. 4. **TABLE No. 2.—CONTINUED.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
151	Mar.	5	Kalamazoo	Kalamazoo Steam Laundry	Laundry work	run.	full
152	"	5	"	Newton Buggy Co.	Buggies	"	"
153	"	5	"	Kalamazoo Gazette	Newspaper	"	"
154	"	6	"	Electric Laundry	Laundry work	"	"
155	"	6	"	Kalamazoo Electric Co.	Electricity	"	"
156	"	6	"	D. W. Powell	Lumber	idle	......
157	"	7	Dowagiac	Round Oak Stove works	Stoves	run.	full
158	"	7	"	W. M. Farr	Sand bands	"	part
159	"	7	"	Dowagiac Manufacturing Co.	Grain drills	"	full
160	"	7	"	Colby Milling Co.	Flour and feed	"	"
161	"	7	"	Fred Hedrick	Lumber	idle	......
162	"	9	Niles	Kompass & Stoll	Tables	run.	full
163	"	9	"	Niles Milling Co.	Flour and feed	"	"
164	"	9	"	S. & G. Lacey	Lumber	idle	......
165	"	9	"	Niles Wool Boot Co.	Wool boots	"	......
166	"	9	"	The Earl Storms Co.	Chairs	run.	full
167	"	10	"	Merrell & Stevens Mf'g Co.	Cattle guards	"	"
168	"	10	"	W. M. Sixbey	Dressed lumber	idle	......
169	"	10	"	H. A. Thomas & Co.	Corsets	run.	full
170	"	10	"	Michigan Wire Shovel Co.	Wire shovels	"	"
171	"	10	"	J. S. Tuttle	Leather tufts	"	"
172	"	10	"	Skalla Furniture Co.	Furniture	"	"
173	"	11	"	Michigan Wood Pulp Co.	Paper	"	"
174	"	11	"	Ohio Paper Co.	Straw board	"	"
175	"	11	"	Niles Paper Co.	Paper	idle	......
176	"	11	Buchanan	Zinc Collar Pad Co.	Collar pads	run.	full
177	"	11	"	M. S. Mead	Lumber	idle	......
178	"	12	"	Buchanan Cabinet Co.	Desks	run.	full
179	"	12	"	Hatch Cutlery Co.	Cutlery	"	part
180	"	12	"	Lee & Porter	Wagon axles	"	full
181	"	12	"	Rough Bros. Wagon Works	Wagons	idle	......
182	"	12	New Buffalo	C. & W. M. Railway Shops	Repairs	run.	full
183	"	12	Three Oaks	Jont Wallace	Lumber	idle	......
184	"	13	" "	Warren Featherbone Co.	Featherbone dress stays	run.	full
185	"	13	" "	H. M. Case	Lumber	idle	......
186	"	17	Augusta	American Handle Co.	Handles	run.	full
187	"	17	"	East Ross Basket Co.	Baskets	"	"
188	"	17	Galesburg	S. E. Olin & Co.	Windmills	"	"
189	"	17	Comstock	Comstock Manufacturing Co.	Engines	"	"
190	"	18	Plainwell	Michigan Paper Co.	Paper	"	"
191	"	18	"	Merrill Milling Co.	Flour and feed	"	"
192	"	18	Otsego	Otsego Chair Co.	Chairs	"	"
193	"	18	"	Bardeen Paper Co., Mill No. 1	Paper	"	"
194	"	18	"	Bardeen Paper Co., Mill No. 2	"	"	"
195	"	19	Allegan	Oliver & Co.	Furniture	"	"
196	"	19	"	Cook, Baker & Co.	"	"	"
197	"	19	"	The Newman-Johnson Paper Co.	Paper	idle	......
198	"	19	"	E. B. Born	Wagons	run.	full
199	"	19	"	Allegan Journal	Newspapers	"	"
200	"	23	Lansing	Clark & Co.	Carriages	"	"

District No. 2. *Geo. E. Gunn, Deputy Inspector*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	25	4	10	$410	----	----	------	10	60	yes	----	no	yes	no	‡	yes	yes	----	no	no	----	151
60	60	15	5	----	190	----	----	------	10	60	"	----	yes	"	"	‡	"	"	----	yes	---	----	152
60	60	18	18	----	950	----	----	------	10	60	----	----	"	"	"	‡	"	"	----	"	----	----	153
60	60	16	4	6	240	----	----	------	10	60	yes	----	----	"	"	‡	"	"	yes	"	yes	----	154
*	*	6	6	----	300	----	----	------	12	60	"	----	yes	"	"	‡	"	no	----	"	----	----	155
60	--	7	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	156
60	60	250	248	2	10,260	----	----	------	10	60	yes	----	----	yes	no	‡	yes	no	yes	yes	yes	----	157
60	48	12	2	----	60	----	----	------	10	60	"	----	yes	"	"	‡	"	"	----	"	----	----	158
60	60	250	175	----	5,000	----	----	------	10	60	"	----	----	"	"	‡	"	yes	yes	"	----	----	159
*	*	25	25	----	900	----	----	------	10	60	"	----	yes	"	"	‡	"	"	----	"	----	----	160
60	--	10	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	161
60	60	30	25	----	800	----	----	------	10	60	yes	----	no	yes	no	‡	yes	no	yes	yes	----	----	162
60	60	5	5	----	300	----	----	------	10	60	----	----	yes	"	"	‡	"	yes	----	"	----	----	163
60	--	25	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	164
60	--	80	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	165
60	60	20	20	----	425	----	----	------	10	60	yes	----	no	yes	no	‡	yes	no	yes	yes	----	----	166
60	60	10	7	----	220	----	----	------	10	60	"	----	yes	"	"	‡	"	yes	----	"	----	----	167
60	--	4	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	168
60	60	10	1	2	85	----	----	------	10	60	yes	----	no	yes	no	‡	yes	yes	----	yes	yes	----	169
60	60	15	11	4	425	----	----	------	10	60	"	----	----	"	"	‡	"	"	----	"	"	----	170
60	60	50	30	15	660	----	2	yes	10	60	no	no	no	"	"	no	----	----	----	"	"	----	171
60	60	14	12	----	350	----	----	------	10	60	yes	----	yes	"	"	‡	yes	yes	yes	"	----	----	172
*	*	115	95	20	2,500	----	----	------	10	60	"	yes	"	"	"	‡	"	"	"	"	yes	----	173
*	*	75	40	----	1,600	----	----	------	10	60	"	----	"	"	"	‡	"	"	"	"	----	----	174
*	--	65	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	175
60	60	6	2	----	80	----	----	------	10	60	yes	----	yes	yes	no	‡	yes	yes	----	yes	----	----	176
60	--	5	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	177
60	60	45	38	----	1,300	----	----	------	10	60	yes	----	no	yes	no	‡	yes	yes	yes	yes	----	----	178
60	48	110	102	8	3,000	----	----	------	10	60	"	----	"	"	"	‡	"	no	"	"	yes	----	179
60	60	48	48	----	2,300	----	----	------	10	†30	----	----	----	"	"	‡	"	----	----	"	----	1	180
60	--	35	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	181
60	60	9	9	----	360	----	----	------	10	60	yes	----	----	yes	no	‡	yes	yes	----	yes	----	----	182
60	--	6	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	183
60	60	295	142	153	6,000	----	15	yes	10	60	yes	----	no	yes	no	‡	yes	yes	----	yes	yes	----	184
60	--	10	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	185
66	60	14	9	----	390	----	----	------	10	60	yes	----	----	yes	no	‡	yes	yes	----	yes	----	----	186
60	60	10	10	----	150	----	1	yes	10	60	"	----	yes	"	"	‡	"	"	----	"	----	----	187
50	60	10	5	----	------	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	"	----	----	188
60	60	40	20	----	800	----	----	------	10	60	"	----	"	"	"	‡	"	"	yes	"	----	1	189
*	*	50	28	22	1,600	----	----	------	10	60	"	yes	"	"	"	‡	"	no	----	"	yes	----	190
*	*	9	9	----	360	----	----	------	10	60	"	----	no	"	"	‡	"	yes	yes	"	----	----	191
60	60	100	100	----	2,600	----	----	------	10	60	"	no	"	"	"	‡	"	"	"	"	----	----	192
*	*	187	103	84	4,850	----	----	------	10	60	"	yes	yes	"	"	‡	"	"	----	"	yes	1	193
*	*	94	44	50	2,000	----	----	------	10	60	"	"	"	"	"	‡	"	no	----	"	"	----	194
60	60	30	26	----	820	----	----	------	10	60	"	"	no	"	"	‡	"	yes	----	"	----	----	195
60	60	30	30	----	950	----	1	no	10	60	"	----	"	"	"	‡	"	"	----	"	----	----	196
*	--	24	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	197
60	60	20	5	----	200	----	----	------	10	60	yes	----	yes	yes	no	‡	yes	yes	----	yes	----	----	198
60	60	5	3	2	150	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	"	yes	----	199
60	60	100	88	12	3,000	----	----	------	10	60	"	no	"	"	"	‡	"	"	----	"	"	----	200

*** 144-running day and night.** **† Permit given by inspector.** **‡ None required.**

Inspection book No. 5. **TABLE No. 2.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running is it full or part time?
201	Mar.	23	Lansing	Michigan Knitting Co.	Mittens	run.	full
202	"	23	"	Lansing Paper Box Co.	Paper boxes	"	part
203	"	23	"	Thompson & Van Buren	Printed matter	"	full
204	"	24	"	Hugh Lyons & Co.	Window display fixt's.	"	"
205	"	24	"	U. S. Baking Co. (Lansing Br'nch)	Baked goods	"	"
206	"	24	"	F. Thoman & Bro.	Flour and feed	"	"
207	"	24	"	Lansing Journal	Newspapers	"	"
208	"	24	"	Collver Shirt Co.	Shirts	"	"
209	"	24	"	E. Bement & Sons	Stoves and implements.	"	part
210	"	25	"	Darius D. Thorp	Printed matter	"	full
211	"	25	"	Capitol Steam Laundry	Laundry work	"	"
212	"	25	"	Troy Laundry	" "	"	"
213	"	25	"	Lansing Wagon Works	Wagons	"	part
214	"	25	"	Lansing Confectionery Co.	Confectionery	"	full
215	"	26	"	Kruce & Haviland	Crackers	"	"
216	"	26	"	H. H. Freedman	Cigars	"	"
217	"	26	"	Lansing Artificial Stone Co.	Artificial stone	idle	......
218	"	26	"	Howell Manufacturing Co.	Spokes	run.	full
219	"	26	"	Alexander Furnace M'f'g Co.	Furnaces	idle	......
220	"	27	"	Michigan Wheel Co.	Buggy wheels	run.	full
221	"	27	"	Robert Smith & Co.	Job printing	"	"
222	"	27	"	H. W. Rikard	Sash, doors and blinds.	"	"
223	"	27	"	City Electric Light Plant	Electric light	"	"
224	"	27	"	Capital City Cigar Co.	Cigars	"	"
225	"	27	"	The Van Gorder Laundry	Laundry work	"	"
226	"	28	"	Genesee Fruit Co.	Vinegar	"	"
227	"	28	"	Potter Manufacturing Co.	Furniture	"	"
228	"	31	"	P. F. Olds & Son	Engines and machinery	"	"
229	"	31	"	Maud S. Wind Mill and Pump Co.	Windmills and pumps.	"	part
230	"	31	"	Lansing Iron and Engine Works.	Engines and machinery	"	"
231	"	31	"	Michigan Condensed Milk Co.	Condensed milk	"	full
232	"	31	"	Severance & Co.	Baked goods	"	"
233	Apr.	1	"	Boise & Burdick	Furniture	"	"
234	"	1	"	Hall Lumber Co.	Sash, doors and blinds.	"	part
235	"	1	"	The Kneeland Crystal Cream. Co.	Creameries	"	full
236	"	1	"	Hammell Cigar Co.	Cigars	"	"
237	"	1	"	The Lansing Pants & Overall Co.	Pants and overalls	"	"
238	"	2	"	Lansing Spoke Co.	Spokes	"	"
239	"	2	"	Capital Lumber Co.	Dressed lumber	idle	......
240	"	2	"	Pearl Mills	Flour and feed	run.	part
241	"	2	"	Hildreth & Co.	Machinery	"	full
242	"	2	"	North Lansing Milling Co.	Flour and feed	"	part
243	"	2	"	W. B. Stone & Co.	Sash, doors and blinds.	"	"
244	"	3	"	Michigan Stave and Barrel Co.	Staves and barrels	idle	......
245	"	3	"	A. Foerster	Beer	run.	full
246	"	3	"	Queen Bee Cigar Co.	Cigars	"	"
247	"	3	"	Lansing Wheelborrow Works	Wheelborrows	"	"
248	"	7	Grand Ledge	Grand Ledge Chair Co.	Chairs	"	"
249	"	7	"	West Bros.	Sash, doors and blinds.	"	"
250	"	8	"	H. R. Streeter	Machinery	"	"

District No. 2. ***Geo. E. Gunn, Deputy Inspector.***

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	75	3	7	$175	----	----	------	10	60	----	no	no	no	no	no	yes	yes	----	yes	yes	----	201
60	48	20	----	3	80	----	1	no	10	60	----	yes	yes	yes	"	yes	"	"	----	"	"	----	202
60	60	16	8	3	540	----	----	------	10	60	yes	"	"	"	"	"	"	"	----	"	"	----	203
60	60	21	20	1	600	----	----	------	10	60	"	----	"	"	"	"	"	"	----	"	"	----	204
60	60	10	4	4	400	----	----	------	10	60	"	yes	"	"	"	no	"	"	----	"	"	1	205
60	60	5	5	----	240	----	----	------	10	60	"	----	"	"	"	‡	"	no	yes	"	----	----	206
60	60	18	15	3	------	----	----	------	10	60	"	----	"	"	"	‡	"	yes	----	"	yes	----	207
60	60	3	----	3	75	----	----	------	10	60	----	----	"	"	"	‡	----	----	----	"	"	----	208
60	48	523	417	6	14,000	----	----	------	10	60	yes	yes	"	"	"	yes	yes	no	yes	"	"	----	209
60	60	79	49	30	3,300	----	----	------	10	60	"	"	no	"	"	"	"	yes	----	"	"	----	210
60	60	6	2	4	170	----	----	------	10	60	"	----	----	"	"	‡	"	"	----	"	"	----	211
60	60	6	2	4	155	----	----	------	10	60	"	----	yes	"	"	‡	"	"	----	"	no	1	212
60	48	120	82	8	3,000	----	----	------	10	60	"	yes	"	"	"	‡	"	"	----	"	yes	----	213
60	60	8	4	3	400	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	"	----	----	214
60	60	6	6	----	215	----	----	------	10	60	"	----	no	"	"	‡	"	no	----	"	----	----	215
48	48	5	4	----	150	----	----	------	8	60	----	----	----	"	"	‡	----	----	----	"	----	----	216
60	--	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	217
60	*	31	31	----	700	----	----	------	10	60	yes	----	yes	yes	no	‡	yes	no	----	yes	----	----	218
60	-	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	219
60	60	30	19	1	830	----	----	------	10	60	yes	yes	yes	yes	no	‡	yes	yes	----	yes	yes	----	220
60	60	100	69	26	4,000	----	----	------	10	60	"	"	"	"	"	yes	"	"	----	"	"	----	221
60	60	37	37	----	2,000	----	----	------	10	60	"	"	"	"	"	‡	"	"	yes	"	----	1	222
72	72	6	6	----	825	----	----	------	----	60	"	----	"	"	"	‡	"	no	----	"	----	----	223
48	48	17	15	2	650	----	----	------	8	60	----	----	----	"	"	‡	----	----	----	"	no	----	224
60	60	13	4	9	390	----	----	------	10	60	yes	----	yes	"	"	‡	yes	yes	----	"	yes	----	225
60	60	30	2	----	90	----	----	------	10	60	"	yes	"	"	"	‡	"	"	----	"	----	----	226
60	60	125	50	----	1,600	----	----	------	10	60	"	"	"	"	"	‡	"	"	yes	"	----	1	227
60	60	26	26	----	1,100	----	----	------	10	50	"	no	"	"	"	‡	"	"	----	"	----	----	228
60	48	60	35	----	1,450	----	----	------	10	60	"	yes	"	"	"	‡	"	"	----	"	----	----	229
60	48	125	35	----	1,100	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	"	----	----	230
60	60	100	40	30	2,600	----	----	------	--	----	"	yes	"	"	"	‡	"	no	----	"	yes	----	231
60	60	3	3	----	100	----	----	------	10	60	----	----	----	"	"	‡	----	----	----	"	----	----	232
60	60	3	3	----	120	----	----	------	10	60	yes	----	yes	"	"	‡	yes	yes	----	"	----	----	233
60	54	8	8	----	260	----	----	------	10	60	"	yes	no	"	"	‡	"	"	----	"	----	----	234
60	60	13	11	2	600	----	----	------	10	60	"	----	yes	"	"	‡	"	no	----	"	yes	----	235
48	48	70	45	20	2,300	----	1	yes	8	60	"	yes	"	"	"	‡	----	----	----	"	"	----	236
60	60	90	15	75	2,000	----	----	------	10	60	"	"	"	"	"	yes	yes	yes	----	"	"	----	237
60	60	50	45	----	1,400	----	----	------	10	50	"	"	"	"	"	‡	"	no	----	"	----	1	238
60	--	25	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	239
†	72	14	6	----	300	----	----	------	12	60	yes	----	no	yes	no	‡	yes	yes	yes	yes	----	----	240
60	60	10	3	----	120	----	----	------	10	60	"	----	yes	"	"	‡	"	"	----	"	----	----	241
†	60	6	3	----	125	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	"	----	----	242
60	54	30	20	----	800	----	----	------	10	60	"	----	"	"	"	‡	"	"	yes	"	----	----	243
60	--	60	----	----	------	----	----	------	--	----	----	----	----	----	----	----	----	----	----	----	----	----	244
60	60	5	2	----	70	----	----	------	10	60	yes	----	yes	yes	no	‡	yes	yes	----	yes	----	----	245
48	48	9	4	----	160	----	----	------	8	60	----	----	"	"	"	‡	----	----	----	"	----	----	246
60	60	120	117	3	3,500	----	2	yes	10	60	yes	yes	"	"	"	‡	yes	yes	yes	"	yes	----	247
60	60	100	100	----	3,900	----	----	------	10	60	"	----	no	"	"	no	"	"	"	"	----	----	248
60	60	5	2	----	70	----	----	------	10	60	"	----	yes	"	"	‡	"	"	----	"	----	----	249
60	60	5	5	----	200	----	----	------	10	60	"	----	"	"	"	‡	"	no	----	"	----	----	250

*** 75—running overtime.**
† 144—running day and night.

‡ None required.

Inspection book No. 6. **TABLE No. 2.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
251	Apr.	8	Grand Ledge	Grand Ledge Sewer Pipe Co.	Sewer pipe and tile	idle	......
252	"	8	Mulliken	H. Jones	Lumber	"	......
253	"	8	Sunfield	Sunfield Mfg. Co.	"	"	......
254	"	9	Bellevue	Bellevue Mfg. Co.	Plumbers' supplies	run.	full
255	"	9	"	C. L. Higgins	Lumber	"	"
256	"	10	Eaton Rapids	The T. M. Bissell Plow Co.	Plows	idle	......
257	"	10	"	G. W. Webster	Flour and feed	run.	full
258	"	10	"	Eaton Rapids Woolen Mills	Cloth and yarn	"	"
259	"	10	"	Eaton Rapids Journal	Newspapers	"	"
260	"	10	"	Wm. Smith	Lumber	"	"
261	"	10	"	"	Dressed lumber	idle	......
262	"	13	Sturgis	Aulsbrook & Sturgis	Furniture	run.	full
263	"	13	"	Grobhiser & Crosby Furnit're Co.	"	"	"
264	"	14	"	The Wait & Barnes Furniture Co.	"	"	"
265	"	14	"	The Sturgis Milling Co.	Flour and feed	"	"
266	"	14	"	Sturgis Furniture Co.	Furniture	idle	......
267	"	14	"	J. H. Whitmer	Sash, doors and blinds	run.	full
268	"	14	Coldwater	The Pratt Mfg. Co.	Hand sleds and cutters	"	"
269	"	15	"	N. Harlow	Furniture	"	"
270	"	15	"	Coldwater Stove Co.	Stoves	"	"
271	"	15	"	J. B. Hellenberg	Wood turning	"	"
272	"	15	"	C. W. Johnson	Barrels	"	"
273	"	15	"	Wm. A. Coombs (Mill A.)	Flour and feed	"	"
274	"	15	"	B. H. Calkins	Barrels	"	"
275	"	16	"	O'Shaughnessy Bros.	Cigars	"	"
276	"	16	"	A. J. Pierce	"	"	"
277	"	16	"	American Cigar Co.	"	"	"
278	"	16	"	Coldwater Cigar Box Factory	Cigar boxes	"	"
279	"	16	"	Ball Bros.	Sash, doors and blinds	"	"
280	"	17	White Pigeon	Sulton Buggy & Cart Co.	Buggies	"	"
281	"	17	Three Rivers	L. J. Knauss	Harnesses	"	"
282	"	17	"	Carl Klocke	Cigars	"	"
283	"	17	"	The Initial Toe Pad Co.	Carriage trimmings	"	"
284	"	17	"	Three Rivers Robe Tannery	Robes	"	"
285	"	18	"	Three Rivers Roller Mills	Flour and feed	"	"
286	"	18	"	Whitmore Air Purifier Co.	Purifiers	"	part
287	"	20	"	Roberts, Thorp & Co.	Railway specialties	"	"
288	"	20	"	Sheffield Car Co.	" "	"	"
289	"	20	"	Three Rivers Paper Co.	Paper	"	full
290	"	20	"	A. N. Hill	Barrels	"	"
291	"	20	"	Three Rivers Herald	Newspapers	"	"
292	"	20	Cassopolis	Bunn & Hayden	Lumber	"	"
293	"	20	Marcellus	Adjustable School Seat Mfg. Co.	School seats	idle	......
294	"	21	Battle Creek	C. W. Severance	Baked goods	run.	full
295	"	21	"	Postum Cereal Co.	Substitute for coffee	"	"
296	"	27	Marshall	Edgerton Bros.	Caskets	"	part
297	"	27	"	Royal Cycle Co.	Bicycles	"	full
298	"	27	"	Marshall Furnace Co.	Furnaces	"	"
299	"	27	"	Marshall Wagon & Windmill Co.	Wagons	"	"
300	"	27	"	C. H. Smith	Cigars	"	"

District No. 2. *Geo. E. Gunn, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water-closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	--	70	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	251
60	--	10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	252
60	--	10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	253
60	60	15	15	----	$450	----	----	----	10	60	yes	----	yes	yes	no	†	yes	yes	----	yes	----	----	254
60	60	6	4	----	125	----	----	----	10	60	"	----	----	"	"	†	"	"	----	"	----	----	255
60	--	20	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	256
60	60	3	3	----	65	----	----	----	10	60	yes	----	yes	yes	no	†	yes	no	----	yes	----	----	257
60	60	15	14	1	425	----	----	----	10	60	"	----	"	"	"	no	"	"	----	"	yes	----	258
60	60	5	4	1	150	----	----	----	10	60	"	----	"	"	"	†	"	yes	----	"	"	----	259
60	60	50	25	----	900	----	----	----	10	60	"	----	"	"	"	†	"	"	----	"	----	----	260
60	--	25	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	261
60	60	80	80	----	2,500	----	----	----	10	60	yes	yes	yes	yes	no	†	yes	yes	yes	yes	----	----	262
60	60	100	100	----	3,000	----	----	----	10	60	"	"	"	"	"	†	"	"	"	"	----	----	263
60	60	125	125	----	3,200	----	----	----	10	60	"	"	"	"	"	†	"	"	"	"	----	----	264
*	*	14	14	----	500	----	----	----	10	60	"	"	no	"	"	†	"	"	"	"	----	----	265
60	--	50	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	266
60	60	10	5	----	200	----	----	----	10	60	yes	----	----	yes	no	†	yes	yes	----	yes	----	----	267
60	60	60	50	----	1,840	----	----	----	10	60	"	yes	yes	"	"	†	"	"	yes	"	----	----	268
60	60	20	15	----	450	----	----	----	10	60	"	"	"	"	"	†	"	"	"	"	----	----	269
60	60	75	50	----	2,000	----	----	----	10	60	"	----	"	"	"	†	"	"	no	"	----	----	270
60	60	10	10	----	325	----	----	----	10	60	"	----	"	"	"	†	"	"	----	"	----	----	271
60	60	50	30	----	900	----	----	----	10	60	"	no	"	"	"	†	"	no	----	"	----	----	272
*	*	28	28	----	1,356	----	----	----	10	60	"	----	no	"	"	†	"	yes	yes	"	----	----	273
60	60	50	50	----	1,750	----	----	----	10	60	"	----	yes	"	"	†	"	"	----	"	----	----	274
48	48	9	3	----	185	----	----	----	8	60	----	----	----	"	"	†	----	----	----	"	----	----	275
48	48	6	6	----	230	----	----	----	8	60	----	----	----	"	"	†	----	----	----	"	----	----	276
60	60	70	24	24	1,550	----	----	----	10	60	yes	yes	yes	"	"	†	----	----	----	"	yes	----	277
60	60	12	5	6	485	----	----	----	10	60	"	no	no	"	"	†	yes	yes	----	"	"	----	278
60	60	20	7	----	250	----	----	----	10	60	"	----	yes	"	"	†	"	"	----	"	----	----	279
60	60	25	10	----	350	----	----	----	10	60	----	----	"	"	"	†	----	----	----	"	----	----	280
60	60	25	15	----	600	----	----	----	10	60	yes	yes	"	"	"	†	----	----	----	"	----	----	281
48	48	12	8	----	312	----	----	----	8	60	----	----	----	"	"	†	----	----	----	"	----	----	282
60	60	50	31	9	1,300	----	2	no	10	60	yes	yes	yes	"	"	†	yes	yes	----	"	yes	----	283
60	60	12	2	----	65	----	----	----	10	60	"	----	"	"	"	†	----	----	----	"	----	----	284
60	60	9	8	----	400	----	----	----	10	60	"	----	"	"	"	†	yes	yes	yes	"	----	----	285
60	48	20	7	----	250	----	----	----	10	60	"	----	"	"	"	†	"	"	----	"	----	----	286
60	42	125	40	----	1,400	----	----	----	10	60	"	yes	"	"	"	†	"	"	yes	"	----	----	287
60	54	225	224	1	7,500	----	----	----	10	60	"	"	"	"	"	†	"	no	"	"	yes	----	288
*	*	38	26	12	1,500	----	----	----	10	60	"	"	"	"	"	†	"	yes	----	"	"	----	289
60	60	25	4	----	125	----	----	----	10	60	"	----	----	"	"	†	"	"	----	"	----	----	290
60	60	5	2	1	108	----	----	----	10	60	"	----	yes	"	"	†	"	"	----	"	yes	----	291
60	60	14	14	----	425	----	----	----	10	60	"	----	"	"	"	†	"	no	----	"	----	----	292
60	--	25	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	293
60	60	7	3	----	143	----	----	----	10	60	----	----	yes	yes	no	†	----	----	----	yes	----	----	294
60	60	30	11	19	860	----	----	----	10	60	yes	----	no	"	"	†	----	----	----	"	yes	----	295
60	48	28	14	----	325	----	----	----	10	60	"	yes	yes	"	"	†	yes	yes	----	"	----	----	296
60	60	150	137	----	4,250	----	----	----	10	60	"	----	"	"	"	†	"	"	no	"	----	----	297
60	60	20	17	1	700	----	----	----	10	60	"	----	"	"	"	†	"	"	----	"	yes	----	298
60	60	15	15	----	650	----	----	----	10	60	"	yes	"	"	"	†	"	no	----	"	----	----	299
48	48	5	4	1	150	----	----	----	8	60	----	----	"	"	"	†	----	----	----	"	yes	----	300

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* 144 hours—running day and night.

† None required.

Inspection book No. 7. **TABLE No. 2.—Continued.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
801	Apr. 28	Marshall	Page Bros. Buggy Co.	Buggies	run.	full
802	" 28	"	Folding Bath Tub Co.	Bath tubs	"	"
803	" 28	"	C. J. & M. R. R. Machine Shops	Machinery	"	"
804	" 28	"	Marshall School Seat Works	School seats	idle	......
805	" 28	"	Marshall Statesman	Newspapers	run.	full
806	" 29	Albion	Albion Milling Co.	Flour and feed	idle	......
807	" 29	"	Albion Malleable Iron Works	Castings	"	......
808	" 29	"	Thomas J. Furey	Cigars	run.	full
809	" 29	"	Gale M'f'g Co.	Plows	idle	......
810	" 29	"	Elms Buggy Co.	Buggies	run.	full
811	" 29	"	Union Windmill Mfg. Co.	Windmills	"	"
812	" 30	"	W. M. Loder	Building material	"	"
813	" 30	"	F. R. Parmelee	Sash, doors and blinds	idle	......
814	" 30	"	Albion Electric Light Co.	Electricity	run.	full
815	May 1	Jackson	Holton & Weatherwax	Mach'y & corset stays	"	part
816	" 1	"	S. Heyser & Son	Sash, doors and blinds	"	full
817	" 1	"	The Knickerbocker Co.	Flour mill machinery	"	part
818	" 1	"	Wm. Eberbach	Cigars	"	full
819	" 1	"	American Steam Laundry	Laundry work	"	"
820	" 2	"	Elyria Variety Works	Specialties	"	"
821	" 2	"	J. G. Leslie	Granite	"	"
822	" 4	"	Jackson Glass Works	Mirrors & ornam't glass	"	part
823	" 4	"	Coronet Corset Co.	Corsets	"	full
824	" 4	"	U. S. Baking Co. (Jackson branch)	Baked goods	"	"
825	" 4	"	C. A. Trask	Machinery	"	"
826	" 4	"	Smalley Bros.	Brooms	"	"
827	" 5	"	Crown Paper Co.	Paper bags	"	"
828	" 5	"	Harhule Brewing Co.	Beer	"	"
829	" 5	"	City Rendering Works	Fertilizers	"	"
830	" 5	"	Central City Soap Co.	Soap	"	"
831	" 5	"	Mich. Mfg Co.	Carriages	"	"
832	" 6	"	J. B. Timberlake	Wire novelties	"	"
833	" 6	"	Cone & Wilt	Bicycles	"	"
834	" 8	"	I. N. Branch	Baked goods	"	"
835	" 8	"	Reliance Corset Co.	Corsets	"	"
836	" 8	"	Bennett Clay Machinery Co.	Machinery	"	"
837	" 8	"	Harmon Mfg. Co.	Dust collectors	"	"
838	" 8	"	Thorpe Carriage Co.	Carriages	"	"
839	" 9	"	Dennis Machine Co.	Machinery	"	part
840	" 9	"	G. D. Wolcott & Son	"	"	full
841	" 9	"	Smith & Adams	Sash, doors and blinds	"	"
842	" 11	"	Jackson Gas & Fuel Co.	Gas	"	"
843	" 11	"	Central City Mattress Factory	Mattresses	"	"
844	" 11	"	Eldred Mill Co.	Flour and feed	"	part
845	" 11	"	Doig & Riley	Sash, doors and blinds	"	full
846	" 11	"	Jackson Light & Power Co.	Electricity	"	"
847	" 11	"	Lewis Blessing	Boxes	"	"
848	" 12	"	Novelty Mfg. Co.	Oil stoves	"	"
849	" 12	"	Jackson Paper Co.	Paper	"	"
850	" 12	"	Austin, Tomlinson & Webster	Wagons	"	"

District No. 2. ***Geo. E. Gunn, Deputy Inspector.***

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	65	50	----	$1,750	----	----	------	10	60	yes	yes	yes	yes	no	‡	yes	yes	----	yes	----	1	301
60	60	25	25	----	975	----	----	------	10	60	“	“	“	“	“	‡	“	“	yes	“	----	----	302
60	60	100	94	----	3,675	----	----	------	10	60	“	----	----	“	“	‡	“	“	----	“	----	----	303
60	--	45	----	----	------	----	----	------	----	----	--	----	----	----	----	----	----	----	----	----	----	----	304
60	60	5	3	2	180	----	----	------	10	60	yes	----	yes	yes	no	‡	yes	yes	----	yes	no	----	305
*	--	25	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	---	----	----	----	----	306
60	--	125	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	307
48	48	13	11	----	370	----	1	yes	8	60	----	----	yes	yes	no	‡	----	----	----	yes	----	----	308
60	--	300	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	309
60	60	60	59	1	2,600	----	----	------	10	60	yes	----	yes	yes	no	‡	yes	yes	yes	yes	yes	----	310
60	60	16	15	1	------	----	----	------	10	60	“	----	“	“	“	‡	“	“	---	“	“	----	311
60	60	10	10	----	350	----	----	------	10	60	“	----	“	“	“	‡	“	“	----	“	----	----	312
60	--	5	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	313
60	60	4	4	----	160	----	----	------	10	60	yes	----	----	yes	no	‡	yes	yes	----	yes	----	----	314
60	54	107	36	10	1,800	----	----	------	10	60	“	yes	yes	“	“	‡	“	“	----	“	yes	----	315
54	54	55	55	----	2,000	----	----	------	9	60	“	no	“	“	“	‡	“	“	yes	“	----	----	316
60	48	25	7	----	364	----	----	------	10	60	“	----	“	“	“	‡	“	no	“	“	----	----	317
48	48	5	4	----	135	---	1	yes	8	60	----	----	----	“	“	‡	----	----	----	“	----	----	318
60	60	----	5	9	300	----	----	------	10	60	yes	----	yes	“	“	‡	yes	yes	----	no	no	----	319
60	60	14	6	----	260	----	----	------	10	60	“	----	no	“	“	‡	“	“	----	yes	----	----	320
60	60	4	2	----	140	----	----	------	10	60	----	----	----	“	“	‡	----	----	----	“	----	----	321
60	38	35	24	1	650	----	----	------	10	60	yes	yes	yes	“	“	‡	yes	yes	----	“	yes	----	322
60	60	175	15	160	3,300	----	4	yes	10	60	“	“	“	“	“	‡	“	“	----	“	“	----	323
60	60	16	10	6	650	----	----	------	10	60	“	“	“	“	“	‡	“	“	----	“	“	----	324
60	60	8	6	----	280	----	----	------	10	60	----	----	“	“	“	‡	“	“	----	“	----	----	325
60	60	12	12	----	550	----	----	------	10	60	yes	yes	“	“	“	‡	“	“	----	“	----	----	326
60	60	7	5	----	115	----	----	------	10	60	“	“	“	“	“	‡	----	----	----	“	----	----	327
60	60	12	12	----	600	----	----	------	10	60	“	----	“	“	“	‡	yes	yes	----	“	----	----	328
60	60	5	3	----	120	----	----	------	10	60	“	no	“	“	“	‡	“	“	----	“	----	----	329
60	60	40	37	3	1,580	----	----	------	10	60	“	yes	no	“	“	‡	“	“	----	“	yes	----	330
60	60	60	57	3	2,500	----	----	------	10	60	“	“	yes	“	“	‡	“	“	----	“	“	----	331
60	60	28	12	----	400	----	----	------	10	60	“	“	“	“	“	‡	“	“	yes	“	----	----	332
60	†	16	16	----	540	----	----	------	10	60	“	----	“	“	“	‡	“	“	----	“	----	----	333
60	60	6	4	----	175	----	----	------	10	60	----	----	----	“	“	‡	“	“	----	“	----	----	334
60	60	73	5	55	1,500	----	----	------	10	60	yes	no	yes	“	“	yes	“	“	----	“	yes	----	335
60	60	6	2	----	100	----	----	------	10	60	“	yes	“	“	“	‡	“	“	----	“	----	----	336
54	54	30	21	----	875	----	----	------	9	60	“	“	“	“	“	yes	“	“	----	“	----	----	337
60	60	160	125	5	4,350	----	----	------	10	60	“	“	“	“	“	“	“	“	yes	“	yes	----	338
60	54	35	13	----	600	----	----	------	10	60	“	----	“	“	“	‡	“	“	----	“	----	----	339
60	60	35	25	----	866	----	----	------	10	60	“	----	“	“	“	‡	“	“	----	“	----	----	340
54	54	26	25	1	885	----	---	------	9	60	“	----	“	“	“	‡	“	“	yes	“	yes	----	341
60	60	3	3	----	150	----	----	------	10	60	“	----	“	“	“	‡	“	“	----	“	----	----	342
60	60	4	3	1	85	----	----	------	----	60	----	----	----	“	“	‡	----	----	----	“	yes	----	343
*	90	20	15	----	850	----	----	------	10	60	yes	yes	yes	“	“	‡	yes	no	yes	“	----	----	344
54	54	35	21	----	1,000	----	----	------	10	60	“	----	“	“	“	‡	“	yes	----	“	----	----	345
60	60	6	6	----	300	----	----	------	10	60	“	----	----	“	“	‡	“	“	----	“	----	----	346
60	60	45	10	25	750	----	----	------	10	60	“	----	----	“	“	‡	“	“	----	“	yes	----	347
60	60	130	65	----	2,125	----	----	------	10	60	“	no	yes	“	“	‡	“	“	yes	“	----	----	348
*	*	28	25	3	1,000	----	--	------	10	60	“	yes	“	“	“	‡	“	“	----	“	yes	----	349
60	60	100	75	----	2,500	----	2	no	10	60	“	no	“	“	“	‡	“	no	yes	“	----	----	350

† 72—running over time. **‡ None required.**
*** 144 hours—running night and day.**

Inspection book No. 8. **TABLE No. 2.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
351	May	12	Jackson	Christy Saddle Works	Bicycle saddles	run.	full
352	"	12	"	Jackson City Boiler Works	Boilers	"	part
353	"	12	"	Withington & Cooley Mfg. Co.	Garden tools	"	full
354	"	13	"	M. C. R. R. Machine Shops	Machinery	"	"
355	"	13	"	M. C. R. R. Wood Shops	General woodwork	"	part
356	"	13	"	Standard Starch Co.	Starch	idle	......
357	"	13	"	Jackson Brewing & Malting Co.	Beer	run.	full
358	"	13	"	Standard Underwear Mfg. Co.	Underwear	"	"
359	"	13	"	White Laundry	Laundry work	"	"
360	"	14	"	Bortree Corset Co.	Corsets	"	"
361	"	14	"	Jackson Daily Citizen	Newspaper	"	"
362	"	14	"	Morning Patriot	"	"	"
363	"	14	"	Jackson Corset Co	Corsets	"	"
364	"	14	"	Aspinwall Manufacturing Co.	Potato and corn planters	"	"
365	"	14	"	Jackson Fire Clay Co.	Sewer pipe	idle	......
366	"	15	"	Bennett Sewer Pipe Co.	" "	run.	full
367	"	15	"	Jackson Pulp Co.	Wood pulp	idle	......
368	"	15	"	Michigan State Prison	Wagons, etc.	run.	full
369	"	15	"	Collins Manufacturing Co.	Carriages	"	"
370	"	15	"	John Hutchison Mfg. Co.	Flour mill machinery	"	"
371	"	15	"	National Wheel Works	Buggy wheels	"	"
372	"	16	"	Fuller Buggy Co.	Buggies	"	"
373	"	16	"	Lewis & Allen Spring Works	Vehicle springs	"	"
374	"	16	"	The Michigan Corset Co.	Corsets	"	"
375	"	16	"	Central Oil Gas Stove Co.	Oil stoves	idle	......
376	"	16	"	M. G. Loennecker	Cigars	run.	full
377	"	18	Chester	Richard Bohn	Lumber	idle	......
378	"	25	Jackson	East End Bakery	Baked goods	run.	full
379	"	25	"	Central City Bakery	" "	"	"
380	June	4	St. Joseph	Lake Shore Fruit Co.	Fruit packages	"	"
381	"	22	Charlotte	M. S. Berger	Cigars	"	"
382	"	22	"	Jacob Michel	"	"	"
383	"	23	"	Charlotte Steam Laundry	Laundry work	"	"
384	"	23	"	Charlotte Leader	Newspaper	"	"
385	"	24	"	O. E. Packard	Feed	"	"
386	"	24	"	Charlotte Tribune	Newspaper	"	"
387	"	25	"	Benton Manufacturing Co.	Express wagons	idle	......
388	"	25	"	Curtis & Son	Furniture	"	......
389	"	25	"	Chas. Bennett Furniture Co.	"	"	......
390	"	26	"	Dolson & Sons	Carriages	run.	full
391	"	26	"	H. D. Cove	Sash, doors and blinds	"	"
392	"	27	"	Charlotte Manufacturing Co.	Tables	"	"
393	"	27	"	Eaton County Republican	Newspaper	"	"
394	"	30	Homer	Electric Oil Stove Co.	Stoves	"	"
395	July	1	Colon	Lamb Knit Goods Co.	Knit goods	"	"
396	"	1	Centerville	Mich. Central Knitting Mills	" "	"	"
397	"	8	Chelsea	Glazier Stove Co.	Oil stoves	idle	......
398	"	8	"	D. E. Sparks & Son	Flour and feed	run.	full
399	"	8	Dexter	L. Palmer	Baskets	"	"
400	"	9	Ann Arbor	Michigan Furniture Co.	Furniture	"	"

District No. 2. ***Geo. E. Gunn, Deputy Inspector.***

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	40	10	30	$1,200	....	....	......	10	60	....	....	yes	yes	no	†	....	....	....	yes	yes	....	351
60	48	14	2	....	100	....	....	......	10	60	yes	....	....	"	"	†	yes	yes	....	"	....	....	352
60	60	40	40	....	1,450	....	....	......	10	60	"	yes	yes	"	"	†	"	"	yes	"	....	....	353
60	60	356	356	....	16,612	...	....	......	10	60	"	....	"	"	"	†	"	no	....	"	....	....	354
60	54	65	45	....	4,700	....	....	......	10	60	"	....	"	"	"	†	"	"	....	"	....	....	355
60	..	5	....	....	......	....	....	......	....	...	....	....	....	....	....	....	...	....	....	....	...	....	356
60	60	18	12	....	550	....	....	......	10	60	yes	....	yes	yes	no	†	yes	....	....	yes	....	....	357
60	60	400	30	270	7,200	....	....	......	10	60	"	yes	"	"	"	yes	"	yes	....	"	yes	2	358
60	60	34	7	27	866	....	....	......	10	60	"	"	"	"	"	†	"	no	....	"	"		359
60	60	125	7	80	1,800	....	....	......	10	60	"	"	"	"	"	yes	"	yes	....	"	"	....	360
60	60	31	31	....	1,700	...	....	......	10	60	"	"	"	"	"	†	"	"	....	"	....	....	361
60	60	34	33	1	1,900	....	....	......	10	60	"	"	"	"	"	yes	"	"	....	"	yes	....	362
60	60	200	16	124	4,400	....	....	......	10	60	"	"	"	"	"	no	"	"	....	"	"	....	363
60	60	60	30	....	1,000	....	....	......	10	60	"	....	"	"	"	†	"	"	....	"	....	....	364
60	..	50	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	365
60	60	43	43	....	1,090	....	....	......	10	60	yes	yes	yes	yes	no	†	yes	no	....	yes	....	....	366
*	..	38	...	....	......	....	....	......	....	....	....	....	....	....	..	....	....	....	....	....	....	....	367
48	48	815	815	...	......	....	....	......	8	60	yes	yes	yes	yes	yes	†	yes	no	yes	yes	....	....	368
60	60	350	341	9	13,850	....	....	......	10	60	"	"	"	"	no	†	"	yes	"	"	yes	....	369
60	60	35	18	2	850	....	....	......	10	60	"	....	"	"	"	†	"	"	....	"	"	....	370
60	60	107	100	....	3,000	....	2	yes	10	60	"	yes	"	"	"	†	"	no	yes	"	....	....	371
60	60	130	115	4	4,600	....	1	"	10	60	"	"	"	"	"	†	"	yes	"	"	yes	....	372
60	60	70	70	....	2,800	....	....	......	10	60	"	....	....	"	"	†	"	"	....	"	....	....	373
60	60	55	6	34	1,040	....	1	yes	10	60	"	....	yes	"	"	†	"	"	....	"	yes	...	374
60	..	50	....	....	......	....	....	......	....	....	....	....	....	....	....	....	...	....	....	...	....	....	375
48	48	12	4	....	135	....	....	......	8	60	....	....	yes	yes	no	†	....	....	....	yes	....	....	376
60	..	8	...	....	......	....	....	......	....	....	....	...	....	....	....	....	....	....	....	....	....	....	377
60	60	4	3	....	65	....	....	......	10	60	....	....	....	yes	no	†	....	....	....	yes	....	....	378
60	60	4	4	....	100	....	....	......	10	60	....	....	....	"	"	†	yes	yes	....	"	....	....	379
60	60	17	14	3	325	....	....	......	10	60	....	....	....	"	"	†	....	....	....	"	yes	....	380
48	48	6	4	....	150	....	....	......	8	60	....	....	yes	"	"	†	....	....	....	"	....	....	381
48	48	4	4	....	160	....	....	......	8	60	....	....	"	"	"	†	....	....	....	"	....	....	382
60	60	6	4	2	175	....	....	......	10	60	yes	....	...	"	"	†	yes	yes	....	"	no	....	383
60	60	5	4	1	130	....	....	......	10	60	"	....	....	"	"	†	"	"	....	"	yes	...	384
60	60	3	3	....	130	....	....	......	10	60	"	....	yes	"	"	†	"	"	....	"	....	....	385
60	60	9	6	3	260	....	....	......	10	60	"	....	"	"	"	†	"	"	....	"	yes	....	386
60	..	40	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	387
60	..	80	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	388
60	..	60	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	389
60	60	115	56	4	3,000	....	....	......	10	60	yes	yes	yes	yes	no	†	yes	yes	....	yes	yes	....	390
60	60	7	5	....	175	....	....	......	10	60	"	...	"	"	"	†	"	"	....	"	....	...	391
60	60	90	40	....	1,500	....	....	......	10	60	"	yes	"	"	"	†	"	"	yes	"	...	....	392
60	60	7	5	2	215	....	....	......	10	60	....	....	....	"	"	†	"	"	....	"	yes	....	393
60	60	60	60	....	2,400	....	....	......	10	60	yes	....	....	"	"	†	"	"	yes	"	....	...	394
60	60	90	32	58	2,135	....	....	......	10	60	"	yes	yes	"	"	†	"	"	....	"	yes	...	395
60	60	75	3	37	1,800	....	....	......	10	60	"	no	"	"	"	yes	"	"	yes	"	"	....	396
60	..	120	....	....	......	....	...	......	....	....	..	....	....	....	....	....	....	....	....	..	....	....	397
60	60	4	4	....	150	..	....	......	10	60	yes	....	yes	yes	no	†	yes	yes	yes	yes	....	....	398
60	60	12	8	4	300	....	....	......	10	60	"	yes	"	"	"	†	"	"	....	"	yes	....	399
60	60	85	52	....	2,100	....	....	......	10	60	"	"	"	"	"	yes	"	"	yes	"	....	....	400

*** 144 hours-day and night while running.** **† None required.**

Inspection book No. 9. **TABLE No. 2.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
401	July	9	Ann Arbor	Martin & Fisher	Beer	run.	full
402	"	9	"	Central Mills	Flour and feed	"	part
403	"	9	"	Ann Arbor Organ Co.	Organs	idle	......
404	"	9	"	Ann Arbor Manufacturing Co.	Curtain fixtures, etc.	run.	full
405	"	10	"	The Argus	Newspaper	"	"
406	"	10	"	Luick Bros.	Dressed lumber	"	"
407	"	10	"	H. Krapf	Sash, doors and blinds	"	"
408	"	10	"	Ann Arbor Agricultural Imp. Co.	Agricultural impleme'ts	"	"
409	"	10	"	Argo Mills	Flour and feed	"	part
410	"	10	"	Michigan Table Co.	Tables	"	"
411	"	11	"	C. F. Kayser	Cigars	"	full
412	"	11	"	Hay & Todd Manufacturing Co.	Knit goods	"	"
413	"	11	"	Ann Arbor Electric Granite W'ks	Granite work	"	"
414	"	11	"	The Crescent Works	Corsets	"	"
415	"	11	"	The Courier	Newspaper	"	"
416	"	13	"	Ann Arbor Boiler Works	Boilers	idle	......
417	"	13	"	M. M. Seabolt	Laundry work	run.	full
418	"	13	Ypsilanti	Scharf Tag, Label & Box Co.	Tags and labels	"	"
419	"	13	"	Ypsilanti Dress Stay Mfg. Co.	Dress stays	"	"
420	"	13	"	M. McCollough Foundry	Castings	idle	......
421	"	13	"	Ypsilanti Lumber Co.	Sash, doors and blinds	run.	full
422	"	14	"	Worden Bros.	Machinery	"	part
423	"	14	"	C. W. Dickinson	Handles	idle	......
424	"	14	"	Ypsilanti Machine Co.	Machinery	run.	full
425	"	14	"	Shemeld & Cook	Cigars	"	"
426	"	14	"	William Deubel	Flour and feed	"	part
427	"	15	"	H. R. Scovill	Sash, doors and blinds	idle	......
428	"	15	"	Hay & Todd Manufacturing Co.	Knit goods	run.	full
429	"	15	"	White Laundry	Laundry work	"	"
430	"	15	"	Rubber Tipped Dress Stay Co.	Dress stays	"	"
431	"	15	"	Michigan Manufacturing Co.	Machinery	"	"
432	"	16	"	L. Z. Foerster	Beer	"	"
433	"	16	"	Peninsular Paper Co.	Paper	"	"
434	Aug.	10	Delray	Delta Lumber Co.	Sash and doors	"	"
435	"	10	"	Detroit Sulphite Fiber Co.	Paper	"	"
436	"	10	River Rouge	Salliotte & Furgason	Lumber	"	"
437	"	11	"	Brownlee & Co.	"	"	"
438	"	11	"	Dwight Lumber Co.	Dressed lumber	"	"
439	"	11	Wyandotte	Detroit Hoop & Stove Co.	Hoops and staves	idle	......
440	"	11	"	Michigan Alkali Co.	Soda	run.	full
441	"	11	"	Detroit Dry Dock Co.	Iron ships	"	"
442	"	11	"	Lacy & Hurst	Dressed lumber	idle	......
443	"	11	"	Wyandotte City Mills	Flour and feed	run.	full
444	"	12	"	Wyandote Brewing Co.	Beer	"	"
445	"	12	"	Wyandotte Herald	Newspaper	"	"
446	"	12	"	White Swan Steam Laundry	Laundry work	"	"
447	"	12	"	Shelly & Robertson	Hoops and staves	"	part
448	"	12	"	J. H. Bishop & Co.	Fur rugs, etc.	"	full
449	"	12	"	Wyandotte Planing Mill	Sash and doors	idle	......
450	"	13	"	Beals & Selkirk Trunk Co.	Trunks	run.	full

District No. 2. *Geo. E. Gunn, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	5	5	----	$250	----	----	------	10	60	yes	----	yes	yes	no	‡	yes	yes	----	yes	----	----	401
*	60	7	5	----	250	----	----	------	10	60	"	----	"	"	"	‡	"	"	yes	"	----	---	402
60	..	35	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	403
60	60	20	3	1	225	----	----	------	10	60	yes	----	yes	yes	no	‡	yes	yes	----	yes	yes	----	404
60	60	15	10	1	430	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	"	no	----	405
60	60	13	12	----	530	----	----	------	10	60	"	----	"	"	"	‡	"	"	yes	"	----	----	406
60	60	5	5	----	190	----	----	------	10	60	"	----	"	"	"	‡	"	"	"	"	----	----	407
60	60	80	21	----	675	----	----	------	10	60	"	yes	"	"	"	‡	"	"	"	"	----	----	408
*	60	9	6	----	240	----	----	------	10	60	"	----	"	"	"	‡	"	"	"	"	----	----	409
60	30	9	6	----	150	----	----	------	10	60	"	yes	"	"	"	‡	"	"	----	"	----	----	410
48	48	10	10	----	850	----	----	------	10	60	"	"	"	"	"	‡	----	----	----	"	----	----	411
60	60	60	5	55	1,500	----	----	------	10	60	"	"	"	"	"	‡	yes	yes	----	"	yes	----	412
54	54	12	10	----	475	----	----	------	9	60	"	----	----	"	"	‡	"	"	----	"	----	----	413
60	60	20	4	16	600	----	----	------	10	60	"	yes	yes	"	"	‡	"	"	----	"	yes	----	414
60	60	28	16	8	850	----	----	------	10	60	"	no	"	"	"	‡	"	"	----	"	"	----	415
60	..	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	416
60	60	10	1	4	100	----	----	------	10	60	----	----	----	yes	no	‡	----	----	----	yes	yes	----	417
60	60	65	25	40	1,250	----	----	------	10	60	yes	yes	yes	"	"	‡	yes	yes	----	"	"	1	418
60	60	75	11	64	2,000	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	"	"	----	419
60	..	8	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	420
60	60	15	4	----	130	----	----	------	10	60	yes	----	----	yes	no	‡	yes	yes	----	yes	----	----	421
60	48	4	2	----	80	----	----	------	10	60	"	----	yes	"	"	‡	"	"	----	"	----	----	422
60	..	3	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	423
60	60	25	12	----	625	----	----	------	10	60	yes	----	yes	yes	no	‡	yes	yes	----	yes	----	----	424
48	48	6	2	----	80	----	----	------	8	60	----	----	"	"	"	‡	----	----	----	"	----	----	425
*	60	7	4	----	160	----	----	------	10	60	yes	----	"	"	"	‡	yes	yes	yes	"	----	----	426
60	..	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	427
60	60	300	20	255	5,200	----	----	------	10	60	yes	yes	yes	yes	no	yes	yes	yes	----	yes	yes	----	428
60	60	8	2	6	200	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	"	"	----	429
60	60	45	5	25	650	----	----	------	10	60	"	----	----	"	"	‡	"	no	----	"	"	----	430
60	60	30	14	----	500	----	----	------	10	60	"	----	yes	"	"	‡	"	yes	----	"	----	----	431
60	60	9	9	----	360	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	"	----	----	432
*	*	26	18	8	1,000	----	----	------	10	60	"	no	"	"	"	‡	"	no	----	"	yes	----	433
60	60	165	165	----	6,000	----	----	------	10	60	"	----	----	"	"	‡	"	yes	yes	"	----	----	434
*	*	85	83	2	3,450	----	----	------	10	60	"	yes	yes	"	"	‡	"	"	----	"	yes	----	435
60	60	100	62	----	2,600	----	----	------	10	60	"	----	"	"	"	‡	"	"	yes	"	----	----	436
60	60	145	145	----	4,750	----	----	------	10	60	"	yes	"	"	"	‡	"	"	"	"	----	----	437
60	60	200	150	----	4,000	----	10	yes	10	60	"	"	"	"	"	‡	"	"	"	"	----	----	438
60	..	125	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	439
60	60	200	175	----	6,000	----	----	------	10	60	yes	yes	yes	yes	no	‡	yes	yes	----	yes	----	----	440
†	†	700	700	----	28,000	----	----	------	10	60	"	----	----	"	"	‡	"	"	----	"	----	----	441
60	..	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	442
60	60	4	4	----	160	----	----	------	10	60	yes	----	yes	yes	no	‡	yes	yes	----	yes	----	----	443
60	60	8	6	----	280	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	"	----	----	444
60	60	4	3	1	125	----	----	------	10	60	----	----	"	"	"	‡	"	"	----	no	no	----	445
60	60	3	2	1	100	----	----	------	10	60	yes	----	----	"	"	‡	"	"	----	yes	yes	----	446
60	48	50	25	----	700	----	----	------	10	60	"	----	----	"	"	‡	"	no	----	"	----	----	447
60	60	230	108	97	4,300	----	----	------	10	60	"	yes	yes	"	"	‡	"	yes	----	"	yes	----	448
60	..	8	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	449
60	60	105	81	24	2,400	----	----	------	10	60	yes	no	yes	yes	no	no	yes	yes	----	yes	yes	----	450

* 144 hours-night and day while running.
† 120 hours.

‡ None required.

Inspection book No. 10. **TABLE No. 2.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
451	Aug. 13	Wyandotte	D. H. Burrell & Co.	Staves and hoops	run.	full
452	“ 13	“	Eureka Brewing Co.	Beer	“	“
453	“ 13	“	Wyandotte Boat Co.	Boats	idle	......
454	“ 13	Delray	Fischer Bros.	Glue	“	......
455	“ 14	“	Exposition Brewing Co.	Beer	run.	full
456	“ 14	“	Wabash R. R. Machine Shops	Machinery	“	part
457	“ 14	“	Wabash R. R. Car Shops	Repair cars	“	“
458	“ 14	“	Michigan Carbon Works	Fertilizer and glue	“	full
459	“ 14	Woodmere	Cardoni Monumental Works	Monuments	“	“
460	“ 14	“	Woodmere Granite Works	Granite monuments	“	“
461	“ 15	Rockwood	John Strong & Son	Brick and tile	idle	......
462	“ 15	“	John Strong & Son	Staves and heading	“	......
463	“ 15	“	John Strong & Son	Flour and feed	run.	full
464	“ 15	“	Rockwood Creamery Co.	Butter	“	“
465	“ 15	“	E. Baumeister & Son	Baskets	“	“
466	“ 17	Trenton	Trenton Mills	Flour and feed	“	“
467	“ 17	“	Ætna Cooperage Co.	Staves and heading	“	“
468	“ 17	“	Church & Co.	Saleratus	idle	......
469	“ 17	“	N. Manns	Potash	run.	full
470	“ 17	Ecorse	Salliotte & Raupp	Lumber	idle	......
471	“ 18	Flat Rock	Huron Valley Creamery	Butter	run.	full
472	“ 18	“	Flat Rock Mills	Flour	“	“
473	“ 18	“	G. W. Melter & Son	Lumber	idle	......
474	“ 18	“	Huron Valley Mills	Flour	run.	full
475	“ 18	“	Fred Burden	Machinery	“	“
476	“ 19	West Detroit	M. C. R. R. Car Shops	Cars	“	“
477	“ 19	Springwells.	R. H. Hall	Brick	idle	......
478	“ 19	“	A. Lonyo	“	run.	full
479	“ 19	“	Hall & Wolf Co.	“	“	“
480	“ 19	“	Detroit Pressed Brick Co.	“	“	“
481	“ 20	“	Michigan Brass and Iron Works.	Water works supplies	“	“
482	“ 26	Manchester	Kimble & Smith	Sash, doors and blinds	“	“
483	“ 26	Clinton	Clinton Plow Co.	Plows	idle	......
484	“ 26	“	Clinton Woolen Mfg. Co.	Woolen cloth	run.	part
485	Sept. 15	Adrian	Excelsior Steam Laundry	Laundry work	“	full
486	“ 15	“	Goodsell Mfg. Co.	Sash, doors and blinds	“	“
487	“ 15	“	Washington Milling Co.	Flour and feed	“	part
488	“ 15	“	Adrian Brick and Tile Mach. Co.	Brick and tile machines	“	“
489	“ 15	“	Michigan Plating Co.	Silver and nickel plating	idle	......
490	“ 15	“	Electric Light and Power Co.	Electricity	run.	full
491	“ 16	“	The Times	Newspaper	“	“
492	“ 16	“	S. P. Babcock	Corn planters.	“	“
493	“ 16	“	The Press	Newspaper	“	“
494	“ 16	“	Kells & Bros.	Machinery	“	part
495	“ 16	“	Union Brewery	Beer	“	full
496	“ 16	“	Decker & Kaiser	Boilers	idle	......
497	“ 17	“	J. Callahan	Cigars	run.	part
498	“ 17	“	Adrian Plating Works	Silver and nickel plating	“	full
499	“ 17	“	Michigan Granite Co.	Monuments	“	“
500	“ 17	“	Cornell & Knapp	Labeling machine	idle	......

District No. 2. *Geo. E. Gunn, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water-closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	130	130	----	$4,500	----	6	yes	10	60	yes	----	----	yes	no	†	yes	yes	----	yes	----	----	451
60	60	6	6	----	275	----	----	------	10	60	"	----	yes	"	"	†	"	"	----	"	----	----	452
60	..	125	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	453
60	..	45	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	454
60	60	10	10	----	500	----	----	------	10	60	yes	----	yes	yes	no	†	yes	yes	----	yes	----	----	455
60	48	26	20	----	1,000	----	----	------	10	60	"	----	"	"	"	†	"	"	----	"	----	----	456
60	48	30	30	----	1,000	----	----	------	10	60	----	----	----	"	"	†	----	----	----	"	----	----	457
60	60	250	225	----	7,500	----	----	------	10	60	yes	yes	yes	"	"	†	yes	yes	----	"	----	----	458
54	54	10	5	----	250	----	----	------	9	60	"	----	----	"	"	†	"	"	----	"	----	----	459
54	54	12	10	----	690	----	----	------	9	60	"	----	yes	"	"	†	"	"	----	"	----	----	460
60	..	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	461
60	..	24	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	462
60	60	6	3	----	120	----	----	------	10	60	yes	----	yes	yes	no	†	yes	no	yes	yes	----	----	463
60	60	3	3	----	90	----	----	------	10	60	"	----	----	"	"	†	"	yes	----	"	----	----	464
60	60	16	6	----	150	----	----	------	10	60	"	----	yes	"	"	†	"	"	----	"	----	----	465
60	60	3	3	----	120	----	----	------	10	60	"	----	"	"	"	†	"	"	----	"	----	----	466
60	60	60	60	----	2,300	2	4	yes	10	60	"	----	"	"	"	†	"	no	----	"	----	----	467
60	..	75	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	468
60	60	4	4	----	140	----	----	------	10	60	yes	----	----	yes	no	†	yes	yes	----	yes	----	----	469
60	..	75	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	470
60	60	3	3	----	80	----	----	------	10	60	yes	----	----	yes	no	†	yes	yes	----	yes	----	----	471
60	60	11	11	----	330	----	----	------	10	60	"	----	yes	"	"	†	"	no	----	"	----	----	472
60	..	6	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	473
60	60	2	2	----	80	----	----	------	10	60	yes	----	yes	yes	no	†	yes	no	----	yes	----	----	474
60	60	4	3	----	120	----	----	------	10	60	----	----	----	"	"	†	"	yes	----	"	----	----	475
60	60	600	460	----	17,000	----	----	------	10	60	yes	no	yes	"	"	†	"	no	yes	"	----	----	476
60	..	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	477
60	60	20	20	----	700	----	4	yes	10	60	yes	----	----	yes	no	†	yes	yes	----	yes	----	----	478
60	60	25	19	3	800	2	4	"	10	60	"	----	----	"	"	†	"	"	----	"	yes	----	479
60	60	30	25	----	850	----	3	"	10	60	"	----	----	"	"	†	"	no	----	"	----	----	480
60	60	200	175	----	8,500	----	----	------	10	60	"	yes	yes	"	"	†	"	yes	----	"	----	----	481
60	60	10	6	----	191	----	----	------	10	60	----	----	"	"	"	†	"	no	----	"	----	----	482
60	..	24	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	483
60	54	135	55	80	4,000	----	----	------	10	60	yes	yes	yes	yes	no	yes	yes	yes	----	yes	yes	----	484
60	60	6	3	3	156	----	----	------	10	60	"	----	----	"	"	†	"	"	----	"	no	----	485
60	60	22	22	----	825	----	----	------	10	60	"	----	yes	"	"	†	"	"	yes	"	----	----	486
*	90	----	5	----	300	----	----	------	10	60	"	----	"	"	"	†	"	"	"	"	----	----	487
60	30	30	3	----	90	----	----	------	10	60	"	----	"	"	"	†	"	"	----	"	----	----	488
60	..	8	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	489
*	*	5	5	----	220	----	----	------	10	60	yes	----	yes	yes	no	†	yes	yes	----	yes	----	----	490
60	60	25	19	1	850	----	----	------	10	60	"	----	"	"	"	†	"	no	----	no	no	----	491
60	60	5	5	----	150	----	----	------	10	60	"	----	"	"	"	†	"	yes	----	yes	----	----	492
60	60	10	7	1	408	----	----	------	10	60	"	yes	no	"	"	†	"	"	----	"	yes	----	493
60	48	18	6	----	290	----	----	------	10	60	"	----	----	"	"	†	"	"	----	"	----	----	494
60	60	5	5	----	175	----	----	------	10	60	"	----	yes	"	"	†	"	"	----	"	----	----	495
60	..	6	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	496
60	42	5	5	----	240	----	----	------	10	60	----	----	yes	yes	no	†	----	----	----	yes	----	----	497
60	60	15	7	3	400	----	----	------	10	60	yes	----	no	"	"	†	yes	yes	----	"	yes	----	498
54	54	14	14	----	950	----	----	------	9	60	"	----	----	"	"	†	"	"	----	"	----	----	499
60	..	8	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	500

*** 144 hours-running day and night.**

† None required.

Inspection book No. 11. **TABLE No. 2.—Continued.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
501	Sept. 17	Adrian	Austin & Rose	Sash, doors and blinds	run.	full
502	" 17	"	Adrian Furniture Mfg. Co.	Furniture	idle	......
503	" 18	"	L. S. & M. S. Railway shops	Repair cars	run.	part
504	" 18	"	Page Woven Wire Fence Co.	Wire fence	"	full
505	" 18	"	Gilliland Electric Co.	Novelties	"	"
506	" 18	"	Church Mfg. Co.	Iron pumps	"	"
507	" 18	"	A. E. Palmer Furniture Mfg. Co.	Furniture	"	part
508	" 18	"	Randall Buggy Co.	Buggies	"	full
509	" 19	"	M. H. Higby Lumber Co.	Lumber	idle	......
510	" 19	Tecumseh	H. Brewer & Co.	Clay working machin'ry	run.	part
511	" 19	"	Hessen Bros. & Co.	Castings	"	full
512	" 19	"	Tecumseh Table Co.	Furniture	idle	......
513	" 19	"	M A. Zimmerman	Handles	"	......
514	" 21	Hudson	Hudson Milling Co.	Flour and feed	run.	full
515	" 21	"	Bean & Chamberlain	Bicycles	idle	......
516	" 21	"	N. Lane	Machinery	run.	full
517	" 21	"	H. Kellogg	Harnesses	"	"
518	" 21	Hillsdale	Louis Globenskey	Barrels	"	"
519	" 21	"	E. C. Campbell	Sash, doors and blinds	"	"
520	" 22	"	Hillsdale City Roller Mills	Flour and feed	"	"
521	" 22	"	Hillsdale Cigar Co.	Cigars	"	"
522	" 22	Jonesville	J. J. Deal & Son	Carriages	"	part
523	" 22	"	Grosvenor Milling Co.	Flour and feed	idle	......
524	" 29	Wayne	Prouty & Glass	Carriages and cutters	run.	full
525	" 29	"	Bailey Novelty Works	Machinery	"	"
526	" 29	"	G. A. & T. M. Fleischer	Cigars	"	"
527	" 29	"	Frank Stranger	Lumber	idle	......
528	" 29	"	Wayne Roller Mills	Flour and feed	run.	full
529	" 30	Monroe	Denizer Furniture Co.	Furniture	"	part
530	" 30	"	J. K. Wilder & Son	Agriculture implem'nts	idle	......
531	" 30	"	Monroe Electric Light Co.	Electric light	run.	full
532	" 30	"	C. F. Beck & Son	Sash, doors and blinds	idle	......
533	" 30	"	Monroe City Mills	Flour and feed	run.	full
534	Oct. 1	"	Monroe Commercial	Newspaper	"	"
535	" 1	"	Frank Sedlaczec	Cigars	"	"
536	" 1	"	C. P. Root & Son	Sash, doors and blinds	"	"
537	" 1	"	John Wahl	Beer	"	"
538	" 1	"	Monroe Paper Co.	Paper	"	"
539	" 2	"	Monroe City Laundry	Laundry work	"	"
540	" 2	"	Monroe Steam Laundry	" "	"	"
541	" 2	"	Monroe Democrat	Newspaper	"	"
542	" 2	"	Monroe Foundry & Furnace Co.	Furnaces	"	"
543	" 2	"	J. J. Dusseau	Cigars	"	"
544	" 3	"	W. J. Danz	"	idle	......
545	" 3	"	Boehme & Rauch Cordage Co.	Cordage	run.	full
546	" 3	"	Monroe Butter and Cheese Co.	Butter	"	"
547	" 3	"	Jacob Roeder	Beer	"	"
548	" 3	"	W. E. Sloane	Cigars	"	"
549	" 5	Romulus	Henry Seested Furniture Fact'y	Furniture	idle	......
550	" 5	"	Columbia Wire Works	Wire cloth	"	......

District No. 2. *Geo. E. Gunn, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under sixteen years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	13	8	----	$325	----	----	------	10	60	yes	yes	yes	yes	no	†	yes	yes	yes	yes	----	----	501
60		----	----	----	----	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	502
60	54	227	227	----	8,000	----	----	------	10	60	yes	----	yes	yes	no	†	yes	yes	yes	yes	----	----	503
68	60	140	75	----	6,066	----	----	------	10	60	"	yes	"	"	"	†	"	"	----	"	----	----	504
60	60	170	70	14	2,600	----	----	------	10	60	"	"	"	"	"	†	"	"	yes	"	yes	----	505
60	60	25	10	----	400	----	----	------	10	60	"	"	"	"	"	†	"	"	----	"	----	----	506
60	48	30	20	----	866	----	----	------	10	60	"	----	"	"	"	†	"	"	yes	"	----	----	507
60	60	20	11	----	433	----	----	------	10	60	"	no	"	"	"	†	"	"	----	"	----	----	508
60	..	24	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	509
60	48	55	18	----	560	----	----	------	10	60	yes	----	----	yes	no	†	yes	yes	----	yes	----	----	510
60	60	20	15	----	545	----	----	------	10	60	"	----	----	"	"	†	"	"	yes	"	----	----	511
60	--	30	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	512
60	--	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	513
60	60	6	5	----	215	----	----	------	10	60	yes	----	yes	yes	no	†	yes	yes	yes	yes	----	----	514
60	--	125	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	515
60	60	6	3	----	126	----	----	------	10	60	yes	----	--	yes	no	†	yes	yes	----	yes	----	----	516
60	60	25	6	----	240	----	----	------	10	60	"	yes	yes	"	"	†	----	----	----	"	----	----	517
60	60	25	6	----	200	----	----	------	10	60	"	----	----	"	"	†	yes	yes	----	"	----	----	518
60	60	6	4	----	130	----	----	------	10	60	"	----	yes	"	"	†	"	"	----	"	----	----	519
*	*	65	65	----	2,000	----	----	------	10	60	"	----	"	"	"	†	"	"	----	"	----	----	520
48	48	18	4	----	120	----	----	------	8	60	----	----	----	"	"	†	----	----	----	"	----	----	521
60	54	75	25	----	800	----	----	------	10	60	yes	yes	yes	"	"	†	yes	yes	yes	"	----	----	522
60	--	5	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	523
60	60	77	74	3	2,900	----	----	------	10	60	yes	----	yes	yes	no	†	yes	yes	yes	yes	yes	----	524
60	60	5	2	----	80	----	----	------	10	60	"	----	----	"	"	†	"	"	----	"	----	----	525
60	60	10	4	----	125	----	----	------	10	60	----	----	yes	"	"	†	----	----	----	"	----	----	526
60	--	6	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	527
60	60	3	3	----	120	----	----	------	10	60	yes	----	yes	yes	no	†	yes	yes	yes	yes	----	----	528
60	48	60	31	----	1,150	----	4	yes	10	60	"	yes	"	"	"	†	"	"	"	"	----	----	529
60	--	25	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	530
72	72	3	3	----	120	----	----	------	10	60	yes	----	----	yes	no	†	yes	yes	----	yes	----	----	531
60		----	----	----	----	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	532
60	60	5	5	----	200	----	----	------	10	60	yes	----	yes	yes	no	†	yes	no	----	yes	----	----	533
60	60	10	7	3	300	----	----	------	10	60	"	----	"	"	"	†	"	yes	----	"	no	----	534
60	60	7	2	----	80	----	----	------	10	60	----	----	----	"	"	†	----	----	----	"	----	----	535
60	60	12	6	----	240	----	----	------	10	60	yes	----	yes	"	"	†	yes	yes	yes	"	----	----	536
60	60	22	22	----	1,000	----	----	------	10	60	"	yes	"	"	"	†	"	"	----	"	----	----	537
*	*	15	15	----	500	----	----	------	10	60	"	----	"	"	"	†	"	"	----	"	----	----	538
60	60	6	2	2	120	----	----	------	10	60	"	----	"	"	"	†	"	"	----	"	yes	----	539
60	60	8	4	3	160	----	----	------	10	60	"	----	"	"	"	†	"	"	----	"	"	----	540
60	60	8	8	----	286	----	----	------	10	60	"	----	"	"	"	†	"	"	----	"	----	----	541
60	60	22	22	----	800	----	----	------	10	60	"	yes	"	"	"	†	"	"	yes	"	----	----	542
48	48	5	3	----	120	----	----	------	8	60	----	----	----	"	"	†	----	----	----	"	----	----	543
60	--	4	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	544
60	60	25	25	----	488	----	----	------	10	60	yes	----	yes	yes	no	†	yes	yes	----	yes	----	----	545
60	60	3	3	----	108	----	----	------	10	60	"	----	----	"	"	†	"	"	----	"	----	----	546
72	72	12	12	----	535	----	----	------	12	60	"	----	yes	"	"	†	"	"	----	"	----	----	547
48	48	6	4	----	140	----	----	------	8	60	----	----	--	"	"	†	----	----	----	"	----	----	548
60	--	30	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	549
60	--	30	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	550

* 144 hours-running day and night.

† None required.

Inspection book No. 12. **TABLE No. 2.—Continued.—**

No. given factory for 1898.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
551	Oct.	5	Romulus	J. M. Hummell Mfg. Co.	Window screens	idle	......
552	"	5	"	Romulus Knitting Mills	Knit goods	"	......
553	"	6	Plymouth	Shafer Bros.	Castings	"	......
554	"	6	"	Plymouth Laundry	Laundry work	run.	full
555	"	6	"	Plymouth Cigar Co.	Cigars	idle	......
556	"	6	"	Markham Air Rifle Co.	Air rifles	run.	full
557	"	6	"	L. H. Bennett	Fanning mills	idle	......
558	"	6	"	Daisy Manufacturing Co.	Air rifles	"	......
559	"	7	Northville	J. A. Dubuar Manufacturing Co.	Wheel barrows	run.	part
560	"	7	"	Globe Furniture Co.	Church & school furn.	"	"
561	"	7	"	Clover Condensed Milk Co.	Condensed milk	"	full
562	"	7	"	Columbia Refrigerator Co.	Refrigerators	idle	......
563	"	7	"	American Bell Foundry Co.	Bells	"	......
564	"	7	"	Ely's Manufacturing Co.	Casket mouldings	"	......
565	"	8	South Lyon	South Lyons Manufacturing Co.	Sanitary specialties	"	......
566	"	8	Howell	Mich. Condensed Milk Co.	Condensed milk	run.	full
567	"	8	"	J. M. Clark & Co	Ware house trucks	idle	......
568	"	8	"	Garland Mackintosh Co.	Mackintoshes	run.	full
569	"	8	"	James Wright	Sash, doors and blinds	idle	......
570	"	8	"	Culver Bros.	Cigars	run.	full
571	"	13	Rochester	Western Knitting Mills	Knit goods	"	"
572	"	13	"	D. B. Kressler	Sash, doors and blinds	"	"
573	"	13	"	Monroe Cart Co.	Scientific bean pickers	"	"
574	"	13	"	Peninsular Paper Co.	Paper	"	"
575	"	13	"	Jackson & Co.	Machinery	"	"
576	"	14	Pontiac	Pontiac Steam Laundry	Laundry work	"	"
577	"	14	"	Pontiac Buggy Co.	Buggies	"	"
578	"	14	"	C. V. Taylor	Carriages and cutters	"	"
579	"	14	"	Pontiac Phaeton Co.	Phaetons	idle	......
580	"	14	"	Pontiac Knitting works	Knit goods	run.	full
581	"	14	"	Pontiac Gazette	Newspaper	"	"
582	"	14	"	M. Halfpenny & Co.	Sulkies	"	"
583	"	15	"	C. Howland & Son	Machinery	"	"
584	"	15	"	John Bell & Son	Sash, doors and blinds	"	"
585	"	15	"	O. J. Beaudett & Co.	Buggy bodies	"	"
586	"	15	"	Pontiac Spring Works	Wagon springs	idle	......
587	"	15	"	R. D. Scott & Co.	Buggies	run.	full
588	"	15	"	Eastern Michigan Asylum	Baked goods	"	"
589	"	16	Romeo	Casey & Trembly	Buggies	"	"
590	"	16	"	R. J. Hosner	Door hangers	idle	......
591	"	16	"	H. W. Bradley & Bros.	Cigars	run.	full
592	"	16	"	A. Kennedy	Sash, doors and blinds	"	"
593	"	16	"	D. P. Smith	Lumber	idle	......
594	"	17	Richmond	Richmond Woolen Mills	Yarn and cloth	run.	full
595	"	17	"	Weter, Fanning & Co.	Pickled eggs	"	"
596	"	17	"	G. W. Weston	Sash doors and blinds	idle	......
597	"	17	Lenox	Fred Hoar	" " " "	"	......
598	"	19	Mt. Clemens	Mt. Clemens Brewing Co.	Beer	run.	full
599	"	19	" "	A. Brehler	Sash, doors and blinds	"	part
600	"	19	" "	B. VanLandeghem & Son	Staves	idle	......

District No. 2. *Geo. E. Gunn, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water clo-ets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	--	50	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	551
60	--	29	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	552
60	--	6	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	553
60	60	4	1	1	$70	----	----	------	10	60	----	----	----	yes	no	†	----	----	----	yes	yes	----	554
60	--	6	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	555
60	60	72	20	2	1,500	----	----	------	10	60	yes	yes	yes	yes	no	†	yes	yes	yes	yes	----	----	556
60	--	----	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	557
60	--	----	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	558
60	54	45	30	----	1,050	----	----	------	10	60	yes	no	yes	yes	no	†	yes	no	yes	yes	----	----	559
60	48	250	160	----	6,500	----	----	------	10	60	“	yes	“	“	“	yes	“	yes	“	“	----	----	560
60	60	12	8	4	340	----	----	------	10	60	“	no	“	“	“	†	“	“	“	“	yes	----	561
60	--	60	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	562
60	-	25	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	563
60	--	10	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	564
60	--	35	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	565
60	60	90	45	45	2,600	----	----	------	10	60	yes	yes	yes	yes	no	†	yes	yes	----	yes	yes	----	566
60	--	----	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	567
60	60	25	6	19	750	----	----	------	10	60	yes	----	yes	yes	no	†	yes	yes	----	yes	yes	----	568
60	--	8	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	569
48	48	14	4	----	160	----	----	------	8	60	----	----	----	yes	no	†	----	----	----	yes	----	----	570
60	60	118	12	18	600	----	----	------	10	60	yes	no	yes	“	“	†	yes	yes	----	“	yes	----	571
60	60	12	6	----	240	----	----	------	10	60	“	----	----	“	“	†	“	“	yes	“	----	----	572
60	60	15	5	----	165	----	----	------	10	60	“	----	----	“	“	†	“	“	----	“	----	----	573
*	*	14	12	----	425	----	----	------	10	60	“	yes	yes	“	“	†	“	“	----	“	----	----	574
60	60	6	2	----	80	----	----	------	10	60	“	----	----	“	“	†	“	“	----	“	----	----	575
60	60	10	3	6	200	----	----	------	10	60	“	----	yes	“	“	†	“	“	----	“	yes	----	576
60	60	100	29	1	1,100	----	----	------	10	60	“	yes	“	“	“	†	“	“	----	“	“	----	577
60	60	80	30	----	1,050	----	----	------	10	60	“	“	“	“	“	†	“	“	----	“	----	----	578
60	--	----	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	579
60	60	150	38	32	2,600	----	----	------	10	60	yes	----	yes	yes	no	†	yes	yes	----	yes	yes	----	580
60	60	9	6	8	260	----	----	------	10	60	“	----	“	“	“	†	“	“	----	“	“	----	581
60	60	----	1	----	40	----	----	------	10	60	----	----	“	“	“	†	----	----	----	“	----	----	582
60	60	15	3	----	120	----	----	------	10	60	yes	----	----	“	“	†	yes	yes	----	“	----	----	583
60	60	----	6	----	234	----	----	------	10	60	“	----	yes	“	“	†	“	“	----	“	----	----	584
60	60	90	65	----	2,600	----	----	------	10	60	“	yes	“	“	“	†	“	“	yes	“	----	----	585
60	--	14	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	586
60	60	59	26	2	1,000	----	----	------	10	60	yes	yes	yes	yes	no	yes	yes	yes	----	yes	yes	----	587
54	54	----	8	----	------	----	----	------	9	60	“	“	“	“	“	†	“	“	----	“	“	----	588
60	60	10	4	----	208	----	----	------	10	60	“	“	“	“	“	†	----	----	----	“	----	----	589
60	--	25	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	590
60	60	30	11	5	485	----	----	------	10	60	----	----	yes	yes	no	†	----	----	----	yes	yes	----	591
60	60	8	2	----	70	----	----	------	10	60	yes	----	----	“	“	†	yes	yes	----	“	----	----	592
60	--	25	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	593
60	60	6	1	2	90	----	----	------	10	60	yes	----	yes	yes	no	†	yes	yes	----	yes	yes	----	594
60	60	10	10	----	350	----	----	------	10	60	“	no	“	“	“	†	“	----	----	“	----	----	595
60	--	4	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	596
60	--	4	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	597
60	60	7	7	----	229	----	----	------	10	60	yes	----	yes	yes	no	†	yes	yes	----	yes	----	----	598
60	48	12	4	----	208	----	----	------	10	60	“	----	“	“	“	†	“	“	----	“	----	----	599
60	--	74	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	600

* 144 hours-running day and night.

† None required.

Inspection book No. 13.

TABLE No. 2.—CONCLUDED.—

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
601	Oct. 19	Mt. Clemens.	Detroit & Erin Plank Road Co.	Lumber	idle	...
602	" 19	"	Mt. Clemens Electric Co.	Electricity	run.	full
603	" 19	"	J. Lousby & Son	Sash, doors and blinds	"	"
604	" 20	"	Burkhardt Steam Laundry	Laundry work	"	"
605	" 20	"	M. Glass	Cigars	"	"
606	" 20	"	Mt. Clemens City Mills	Flour and feed	"	"
607	" 20	"	Mt. Clemens Press	Newspaper	"	"
608	" 20	"	Mt. Clemens Monitor	"	"	"
609	" 20	"	Lee Printing Co.	Printed matter	"	"
610	" 21	"	The Model Laundry	Laundry work	"	"
611	" 21	"	John Koehler	Wagons	"	"
612	" 21	"	Donaldson Bros.	Sleighs	"	part
613	" 21	"	T. W. Snook & Son	Staves and heading	"	full
614	" 21	"	Mt. Clemens Cigar Co.	Cigars	"	"
615	" 21	"	Wm. Dulac & Son	Dressed lumber	"	"
616	" 22	"	A. Biewer	Beer	"	"
617	" 22	"	William Rutlen	Cigars	"	"
618	Nov. 7	Mason	Rogers Manufacturing Co.	Carriages	idle	......
619	" 7	"	Mead Milling Co.	Flour and feed	run.	full
620	" 7	"	G. W. Baily	Staves and heading	idle	......
621	" 9	Milan	C. H. Wilson	Lumber	"	......
622	" 9	"	Milan Roller Mills	Flour and feed	run.	full
623	" 9	"	Globe Brick & Tile Works	Brick and tile	idle	......
624	" 9	"	W. P. Lamkin	Electricity and feed	run.	full
625	" 10	Dundee	H. Pulver	Lumber	idle	......
626	" 10	"	Eureka Mills	Flour and feed	run.	full
627	" 10	"	Wm. Slayton	Dressed lumber	"	"
628	" 10	"	Wm. Slayton	Brick and tile	idle	......

District No. 2. *Geo. E. Gunn, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. h'rs males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	..	7	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	601
60	60	5	5	....	$200	....	....	......	10	60	yes	....	....	yes	no	*	yes	no	....	yes	....	....	602
60	60	9	9	....	390	....	....	......	10	60	"	....	yes	"	"	*	"	yes	yes	"	....	....	603
60	60	30	3	10	325	....	....	......	10	60	"	....	"	"	"	*	"	"	....	"	yes	....	604
48	48	4	4	....	156	...	....	......	8	60	....	....	"	"	"	*	....	....	....	"	....	....	605
60	60	7	7	....	340	....	....	......	10	60	yes	....	"	"	"	*	yes	yes	yes	"	....	....	606
60	60	6	5	1	210	....	....	......	10	60	"	....	"	"	"	*	"	"	....	"	yes	....	607
60	60	7	7	....	245	....	....	......	10	60	"	....	"	"	"	*	"	"	....	"	....	....	608
60	60	4	3	1	120	....	....	......	10	60	"	....	....	"	"	*	"	"	....	"	yes	....	609
60	60	4	1	3	100	....	....	......	10	60	....	....	yes	"	"	*	....	....	....	"	"	....	610
60	60	6	3	....	120	....	....	......	10	60	....	....	"	"	"	*	....	....	....	"	....	....	611
60	48	80	60	....	1,950	....	....	......	10	60	yes	yes	"	"	"	*	yes	yes	....	"	....	....	612
60	60	80	50	....	800	....	....	......	10	60	"	....	"	"	"	*	"	"	....	"	....	....	613
48	48	3	3	....	120	....	....	......	8	60	....	....	"	"	"	*	....	....	....	"	....	....	614
60	60	12	4	....	140	....	....	......	10	60	....	....	....	"	"	*	yes	yes	....	"	....	....	615
60	60	4	4	....	200	....	....	......	10	60	yes	....	yes	"	"	*	"	"	....	"	....	....	616
48	48	5	2	....	80	....	...	......	8	60	....	....	....	"	"	*	....	....	....	"	....	....	617
60	..	30	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	618
60	60	4	3	....	120	....	....	......	10	60	yes	....	yes	yes	no	*	yes	yes	....	yes	....	....	619
60	..	18	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	620
60	..	9	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	621
60	60	3	3	....	120	....	....	......	10	60	yes	....	yes	yes	no	*	yes	yes	....	yes	....	....	622
60	..	15	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	623
60	60	6	3	....	120	....	....	......	10	60	yes	yes	yes	yes	no	*	yes	yes	....	yes	....	....	624
60	..	12	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	625
60	60	4	4	....	160	....	....	......	10	60	yes	....	yes	yes	no	*	yes	yes	....	yes	....	....	626
60	60	5	5	....	170	....	....	......	10	60	"	yes	....	"	"	*	"	"	....	"	....	....	627
60	..	20	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	628

* None required.

DEDUCTION FROM THE WORK IN DISTRICT NO. 2.

The Second Factory Inspection District for the year 1896 was composed of the counties of:

Allegan,
Barry,
Branch,
Berrien,
Calhoun,
Cass,
Eaton,
Hillsdale,
Ingham,
Jackson,
Kalamazoo,
Livingston,
Lenawee,
Macomb,
Monroe,
Oakland,
St. Joseph,
Van Buren,
Wayne, except the city of Detroit.

The territory covers the best settled portion of the State. The inspector inspected 628 factories during the year. The goods manufactured, handled or sold in these factories are various, as will be seen by reference to the table. In addition to the factories thoroughly inspected, the inspector revisited 142 which had been previously inspected. In almost every case he found a general inclination by manufacturers to comply with the law.

Factories Inspected.

Number of factories running	509
Number of factories idle	119
Whole number of factories inspected	628
Number running full time	432
Number running part time	77
Whole number running	509

This indicates that over 81 per cent of the factories in the districts were running at date of inspection, and that about 85 per cent of those running were working full time.

Hours per Week.

Hours per week when running full time	39,532
Hours per week at date of inspection	30,929
Loss in hours per week	8,612

This means a weekly loss of time, as compared with when running full time, of 861 days of 10 hours each, or a daily loss of over 143 days.' This loss, alone, to labor foots up many thousand dollars. Very few factories were running over time. Except where running night and day, no factory exacted over 10 hours for a day's work.

Number Employed.

Number of persons employed when running full capacity	30,224
Number of persons employed at date of inspection	20,424
Loss as compared with when running full capacity	9,800
Number of males employed	16,709
Number of females employed	3,715
Total number employed	20,424
Number of places employing females	176

Here is another loss to labor of 9,800 persons daily, in this district alone, which added to the loss in running short time, and computed at $1.19 per day (the average wages paid all employés) makes the enormous sum of over $11,832.17, daily; $307,705.85, monthly, or an annual loss of $3,692,470.20. The average daily wages paid in this district shows about 11 cents less per diem in 1896 than in 1895.

It will be seen that a little over one-third of the factories running employ females and that the latter represent over 18 per cent of the whole number employed.

Child Labor.

Number of children under 14 years of age found employed	6
Number of children under 14 years of age sent home	6
Number of factories where such children were found employed	4
Number of children between 14 and 16 found employed	92
Number of factories where such children were found	30
Number of factories where statements as to age were filed	25
Number of factories where such statements were not filed	5

Number of factories employing children betweeen 14 and 16, 30.

Number of factories where minors work 10 hours per day	458
Number of factories where minors work 9 hours per day	8
Number of factories where minors work 8 hours per day	29
Number of factories where minors work 12 hours per day	4
Number of factories where minors work 11 hours per day	1
Number of factories where minors are not employed	9
Whole number of factories running	509

The law regarding child labor in this district has been most rigidly enforced. Registers and statements for children employed between the ages of 14 and 16 have been carefully examined, and in all cases where the provisions of the law were not complied with, orders were immediately made, with the assurance of immediate compliance.

No cases were found where males under 18 and females under 21 were allowed to clean machinery while in motion.

As a rule manufacturers are willing to comply with the law relating to child labor. Ignorance of the law is sometimes plead, but such excuses have but little weight with the inspector who has taken great pains to furnish copies of the law to every manufacturer requesting it.

Dinner Hour.

The law requires that at least 45 minutes shall be given employés for a dinner hour, unless permission is given by the inspector for a shorter time. Very few factories give less than a full hour, as seen by the following:

Number of factories allowing 60 minutes for dinner	500
Number of factories allowing 50 minutes for dinner	4
Number of factories allowing 45 minutes for dinner	1
Number of factories allowing 35 minutes for dinner	1
Number of factories allowing 30 minutes for dinner	3
Whole number of factories running	509

Hoisting Shafts and Elevators.

Number of factories where hoisting shafts and well holes are protected	433
Number of factories where hoisting shafts and well holes are not protected	2
Number of factories not having hoisting shafts or well holes	74
Whole number factories running	509

Number of factories where automatic elevator protection is provided	135
Number of factories where automatic elevator protection is not provided	39
Number of factories where there are no elevators	335
Whole number of factories running	509

The above indicates that the danger from the open elevator shafts and well holes is growing less and less each year. Manufacturers often vie with each other in securing the best appliances in use.

Stairs and Doors.

Number of factories where stairs are properly protected	363
Number of factories where stairs are not properly protected	39
Number of factories where there are no stairs	107
Whole number of factories running	509

Number of factories where doors swing outward or slide	505
Number of factories where doors do not swing outward or slide	4
Whole number of factories running	509

Number of factories where doors are not locked during working hours	507
Number of factories where doors are locked during working hours	2
Whole number of factories running	509

The law regarding stair protection in factories is very stringent, providing for proper hand rails, rubber for steps and, where females are employed, they must be properly screened. It will be seen that this part of the law is generally observed. In all cases where protection was not complete, orders were immediately issued for the same.

Only four places were found where outside doors did not swing outward or slide, indicating the general willingness of manufacturers to comply with the law. In only two places doors were found locked or bolted during working hours. The safety of employés in this direction is reduced to the minimum.

Fire Escapes.

Fire escapes, to comply with the law, are necessarily costly, but where needed they are none the less necessary. In this district the law is generally complied with. New factories and the remodelling of old ones makes changes each year imperative.

Number of factories inspected where fire escapes were not necessary	470
Number of factories inspected where fire escapes were provided.	28
Number of factories inspected where fire escapes were not provided	11
Whole number of factories running	509

The inspector has met with no serious opposition in this direction in the past year, and thinks all orders will be complied with in the near future.

Machinery, Etc.

Number of factories where shifters are used for throwing belts	444
Number of factories where shifters are not necessary	62
Number of factories where orders were made	3
Whole number of factories running	509

Number of factories where vats, pans, saws and all machinery were properly guarded	366
Number of factories where vats, pans, saws and machinery were not used	68
Number of factories where orders were made	75
Whole number of factories running	509

The law covering the protection of machinery includes every appliance where machinery is used. The inspector was very watchful regarding minor points not generally deemed dangerous—such as set-screws, small belts, etc. The result shows a larger per cent of protection in this direction this year than since the law was enacted. As new machinery takes the place of old, inspectors will find that part of their work less exacting, by reason of knowledge of the law and a willingness of manufacturers to provide the protection required. Shifters for throwing belts are now generally in use.

Sanitary Appliances.

Dust arresters, exhaust fans, wash rooms, water closets and privies have received special attention during the year. There is a general willingness on the part of manufacturers to provide every means for the health and comfort of employés. The following shows the sanitary condition of the factories in this district at the time the inspections were made.

Number of factories where exhaust fans are provided	100
Number of factories where exhaust fans are not necessary	403
Number of factories where orders were made	6
Whole number of factories running	509

Number of factories where there were suitable washrooms	502
Number of factories where there were not suitable washrooms	7
Whole number of factories running	509

Number of factories where waterclosets for females were separate	159
Number of factories where separate waterclosets for females were not necessary	334
Number of factories where waterclosets for females were not separate but should have been	16
Whole number of factories running	509

It is gratifying to know that sanitary regulations in factories are constantly improving, and no requirements of the law are more appreciated by employés than in this respect.

Accidents.

It is a source of pleasure to note the constantly decreasing number of accidents since the factory inspection law went into force. Since the date of inspection in 1895 to the inspection in 1896, only 17 accidents were reported in this district, and of these only two were fatal, the majority being classed as slight. In 1895 there were 23 accidents reported, three of which were fatal.

Following this is a list of changes ordered in the factories inspected during the year, also the accidents as reported.

CHANGES ORDERED DURING YEAR.

DISTRICT NO. 2.

[The number refers to the inspection number in table.]

No. 3.—Ordered railing on side of drive belt in engine room.

No. 5.—Ordered a new system of exhaust fans for machine room.

No. 7.—Ordered handrails on stairs leading from front door to work room.

No. 9.—Ordered set screws on line shaft in lower part of mill removed.

No. 11.—Ordered main drive belt in engine room guarded on side, and automatic trap door for elevator.

No. 14.—Ordered main drive belt to second dynamo guarded on side.

No. 16.—Ordered guard around shaft and gearing of water wheel.

No. 18.—Ordered exhaust fans for emery wheels in machine room.

No. 21.—Ordered handrails on two stairs, one leading from front door to first floor. and one from first to second floor.

No. 23.—Ordered cog gearing on one drill press in machine room guarded, guard on side of trip hammer belt in blacksmith shop, and exhaust fans for emery wheels in grinding room.

No. 24.—Ordered guards over two emery wheels in machine room, guards for cog gearings on ends of fòur iron lathes, and guard in front of two belts on air compresser.

No. 25.—Ordered guards over cog gearings on ends of two iron lathes in shop 10, and line shaft in front of elevator in room B boxed in.

No. 26.—One fire escape on front part of building ordered.

No. 27.—Ordered a strong guard on east side of pulleys of vertical water wheel shaft, to protect drive belts.

No. 29.—Ordered separate closet for females.

No. 32.—Ordered automatic gates for elevator, and guard in front of drive belt engine.

No. 33.—Ordered exhaust fans for four emery wheels in boiler shop, and two in machine shop.

No. 34.—Ordered main drive belt in basement guarded on side.

No. 36.—Ordered handrail on stairs leading from first to second floor, loose pulley on large planer and guard on large belt of same.

No. 42.—Ordered a stronger guard on side of main belt in basement.

No. 43.—Ordered automatic trap door for elevator.

No. 44.—Automatic trap door for elevator ordered.

No. 45.—Ordered handrail on stairs leading to composing room; and back door changed to swing outward.

No. 47.—Ordered guard on side of gearing of vertical water wheel, and handrails on two stairways.

No. 48.—Ordered handrail and railing around stairs in bending room, shifter for matcher belt, and guard back of bolting saw.

No. 51.—Ordered main drive belt guarded on both sides.

No. 53.—Handrail on stairs between first and second floor ordered.

No. 58.—Ordered exhaust fans for emery wheels, and buffing wheels in grinding room.

No. 59.—Ordered counter shaft on large planer guarded.

No. 66.—Ordered handrails on two stairways leading to rag room, and guard in side of main belt of dynamos.

No. 68.—Ordered belt and pulley in well hole guarded.

No. 70.—Ordered handrail on stairway to spinning room, and front door changed to swing outward.

No. 74.—Ordered six large belts running from main shaft guarded in front of pulley on main shaft.

No. 77.—Ordered shifters on tenon machine; handrails on three stairways, two in machine room, and one from finishing room to second floor, and automatic gates on first floor of elevator in finishing room.

No. 79.—Separate closet for females ordered.

No. 80.—Ordered separate closet for females.

No. 88.—Automatic gates for elevator ordered.

No. 90.—Ordered elevator repaired and counter weights for doors cased in, and one fire escape on rear end of factory, with balcony to embrace two windows of work room.

No. 91.—Ordered one fire escape on north side of factory, balconies made to embrace third and fourth windows from east end.

No. 92.—Ordered handrails for two stairs, and guards around fly wheel and main belt on engine.

No. 93.—Main drive belt guarded in front of fly wheel in engine room ordered.

No. 94.—Ordered cog gearings on two iron lathes guarded.

No. 95.—Ordered automatic gates for elevator.

No. 97.—Ordered handrails for two stairways, automatic gates for elevator, and front door changed to swing outward or slide.

No. 100.—Automatic gates for elevator openings ordered.

No. 102.—Ordered automatic gates for elevator.

No. 106.—Ordered railing on side of boiler next to stairs, and guard on side of fly wheel on engine.

No. 109.—Ordered one fire escape on east end of factory to embrace first and second windows from north end on second and third floors.

No. 111.—Automatic gates for elevator openings ordered.

No. 124.—Ordered a new steam pump to supply water for boiler, and new pipes from heater to boiler.

No. 128.—Ordered automatic gates for elevator, and guard for end gears on two iron lathes.

No. 130.—Ordered automatic gates for elevator in store room; guard on side of molding machine belt; guard on side of engine, and one boy sent home under fourteen years of age. Statements filed with name and ages of those employed who were under sixteen years of age.

No. 133.—Ordered elevator gates repaired.

No. 135.—Ordered belts, and pulleys on ends of five roller mills guarded.

No. 145.—Ordered automatic gates for elevator in laundry; guard for cog gearings on bread mixer in bake shop; and guards in front of pulleys on generators No. 3 and No. 4 in electric light plant.

No. 146.—Ordered guard on side of fly wheel on engine, and separate closet for females.

No. 148.—Ordered fly wheel, and belt on engine in repair shop guarded.

No. 149.—Automatic gates for two elevators ordered.

No. 151.—Ordered handrail for stairs, and separate closet for females.

No. 155.—Ordered guard on side of main drive belt of engine in east end of plant.

No. 157.—Ordered cog gearing on one rattler guarded, and exhaust fan pipes repaired in grinding room.

No. 158.—Ordered fly wheel on engine guarded.

No. 162.—Ordered main belt guarded on side in engine room, and hand rail for stairs.

No. 166.—Cog gearing on sounder guarded, and handrails on stairs ordered.

No. 169.—Ordered railing around stairway on upper floor.

No. 171.—Ordered handrails on two stairways; automatic gates for elevator; and one fire escape on front side of factory, built with balconies to embrace two windows from west side.

No. 178.—Ordered handrail on stairs leading from machine room to finishing room.

No. 179.—Ordered railing around top of stairs in work room which leads to basements, and line shaft on first floors guarded between the pulleys.

No. 184.—Ordered handrail on two stairways, one in each shop.

No. 190.—Ordered cog gearing and set screws guarded on the machine that reels the paper from the rolls.

No. 191.—Hand railing for three stairways ordered.

No. 192.—Ordered automatic gates for second floor of elevator opening, and handrails for two stairways in finishing shops.

No. 194.—Ordered railing on side of main rod on small engine in engine room.

No. 195.—Handrails on stairway in machine room ordered.

No. 196.—Ordered handrail for stairway, and statements placed on file with name and age of all children employed under the age of 16 years.

No. 200.—Ordered one automatic gate for elevator in trimming shop on second floor.

No. 201.—Ordered automatic trap gates for elevator, handrails on two stairways, one fire escape on south side of building made with balcony to include the door and window on third floor, and front door changed to swing outward.

No. 202.—Ordered statements filed for children under 16 years of age.

No. 205.—Ordered fire escape on north side of building with iron stairs from window on third floor to roof of engine room.

No. 206.—Ordered vertical shaft on second floor boxed in.

No. 209.—Ordered main drive belt in engine room guarded.

No. 210.—Ordered handrails on stairways leading from composing rooms.

No. 212.—Separate closet for females ordered.

No. 215.—Ordered sprocket gears and cog gears of rolls guarded, guard in front of main drive belt in engine room, and handrail on stairs.

No. 218.—Ordered guard on side of generator belt in engine room next to door leading to dynamo room.

No. 221.—Ordered water closet in book bindery cleaned, and stairs for fire escape in place of ladders now in use, between the balconies.

No. 223.—Ordered guard in front of fly wheel and over main belt on south engine.

No. 224.—Separate closet for females ordered.

No. 228.—Ordered elevator provided with an automatic gate.

No. 231.—Ordered six dies in tin shop guarded, and one more stairs from tin shop to floor below.

No. 234.—Ordered railing at landing of stairs next to elevator, and elevator gate kept unhooked and allowed to work.

No. 235.—Railing around balance wheel of engine ordered.

No. 238.—Ordered railing around elevator on second floor, and guard on side of large pulley in lower part of saw mill.

No. 240.—Ordered railing around landing of stairway on second floor.

No. 248.—Ordered handrail for stairs leading to second floor, and one fire escape on east side of factory.

No. 250.—Ordered line shaft outside of mill boxed in.

No. 257.—Ordered line shaft and gearing in wheel house guarded.

No. 258.—Ordered stairs from back window to roof of boiler room, and cog gearing on washing machine guarded.

No. 265.—Ordered handrails on two stairways, and railing around landing of stairs to second floor.

No. 270.—Exhaust fans for emery wheels in grinding room ordered.

No. 272.—Ordered elevator protected with an automatic gate, and equalizer saws guarded on side.

No. 273.—Handrail on two stairways ordered.

No. 278.—Ordered automatic gates for elevator, and handrail on stairway leading to engine room.

No. 283.—Ordered statements placed on file with names and ages of children under 16 years of age.

No. 288.—Ordered cog gearing on two drill presses in machine room, and main belt on large planer in wood shop guarded, one counter shaft on same planer boxed in.

No. 292.—Ordered counter shaft in planer guarded, and guard in front of tightener on main belt.

No. 295.—Handrails on stairway leading to second floor ordered.

No. 297.—Ordered exhaust fans for grinding room and buffing room to take the dust from emery and buffing wheels.

No. 299.—Ordered cog gearings on tire bending machine guarded.

No. 305.—Separate closet for females ordered.

No. 316.—Automatic gates for elevator on second floor ordered.

No. 317.—Ordered main drive belt in engine room guarded, and line shaft in lower part of factory boxed in.

No. 319.—Separate closet for females ordered.

No. 320.—Ordered railing around head of stairs, and hand rail on stairway.

No. 329.—Automatic trap door for elevator ordered.

No. 330.—Ordered handrail on stairs leading to machine room.

No. 335.—Ordered automatic trap door for upper floor of elevator.

No. 344.—Ordered guard around balance wheel on engine, also on south side of large pulley on main shaft in engine room.

No. 348.—Automatic gates for opening at second floor of elevator ordered.

No. 350.—Ordered automatic gate for opening to elevator in wood shop, guard on side of balance wheel on engine, and statements placed on file with name and ages of all children employed under 16 years.

No. 354.—Ordered main rod and fly wheel in engine room, cog gearings on two iron lathes in machine shop, and splitter back of rip saw guarded.

No. 355.—Ordered main drive belt in engine room guarded.

No. 359.—Ordered main drive belt in engine room guarded.

No. 363.—Ordered one fire escape on east side of machine room, with balconies to embrace fourth and fifth windows from south end.

No. 366.—Ordered guard around fly wheel in engine room.

No. 368.—Ordered line shaft next to elevator in Withington & Cooley shop guarded, also end of counter shaft on large planer in wagon shop removed.

No. 371.—Ordered main belt in engine room guarded on side, and exhaust fan repaired.

No. 380.—Ordered three boys sent home who were under 14 years of age. Revisited the factory June 8th; found the children still at work, and prosecuted the proprietor, who pleaded guilty and paid fine.

No. 383.—Separate closet for females ordered.

No. 396.—Ordered automatic gates for elevator.

No. 405.—Ordered separate closet for female employé.

No. 415.—Ordered automatic gates for elevator in press room.

No. 430.—Ordered belt and pulley on water motor guarded.

No. 433.—Ordered trap doors for two elevators, one in mill and one in stove room, main line shaft in wheel room boxed in, and guard for vertical shaft from water wheel.

No. 445.—Separate closet for females ordered.

No. 447.—Ordered equalizer saws guarded on side.

No. 450.—Ordered automatic gates for elevator, and one fire escape on north side of factory from second and third windows of third floor to roof of engine room.

No. 463.—Ordered main drive wheel in engine room guarded on side next to belt.

No. 467.—Ordered main belt in saw room guarded, and guard on side of equalizer saw in heading mill, and the children who were employed under 14 years of age discharged. Afterwards prosecuted firm for non-compliance with order.

No. 472.—Ordered set screws on line shaft guard.

No. 474.—Ordered vertical water wheel shaft on first floor guarded.

No. 476.—Ordered automatic gates for elevator in paint shop, and guard on side of fly wheel in engine room.

No. 479.—Ordered the children under 14 years of age discharged. Commenced action against the company August 19.

No. 480.—Ordered pulley and belt from line shaft to brick machine No. 1 guarded.

No. 482.—Ordered line shaft in lower part of mill guarded on east end.

No. 485.—Separate closet for female employés ordered.

No. 491.—Ordered a separate closet for females, guard on side of fly wheel of engine and balance wheel of job press guarded.

No. 493.—Ordered handrails on stairs to composing room.

No. 498.—Ordered handrails on stairs.

No. 503.—Ordered cogs and side belt of planer in wood shop guarded.

No. 508.—Ordered trap doors for elevator, and railing on side of opening.

No. 533.—Ordered line shaft in lower part of mill guarded.

No. 534.—Separate closet for female employés ordered.

No. 559.—Ordered automatic trap door for elevator openings and guard on side of main belt in engine room.

No. 561.—Automatic gates for elevator ordered.

No. 571.—Ordered automatic trap door for elevator.

No. 595.—Automatic gates for elevator ordered.

No. 602.—Ordered main belt from line shaft to incandescent machine boxed in.

ACCIDENTS REPORTED DURING YEAR.

DISTRICT NO. 2.

[The number refers to the inspection number in table.]

No. 5.—November 1, 1896. Sam Wood, age 28, married, in the employ of Hastings Table Co., Hastings, lost two fingers on left hand through his own carelessnss. Was disabled five weeks, and did not receive wages during time disabled.

No. 43.—January 30, 1896.—George Mabons, age 21, married, employed as engineer, by Angell Bros., Battle Creek, lost two fingers on the left hand in planer, by carelessness. Did not receive wages during time disabled.

No. 77.—January 28, 1896. S. Crane, age 45, married, employed on rip saw, by Spencer & Barnes, Benton Harbor, lost the ends of two fingers on right hand in reaching across the saw to remove a sliver. He received a benefit in the form of a donation. The saw is provided with splitter which is considered a sufficient guard.

No. 122.—December 18, 1896. A. J. Crandall, age 50, married, foreman, employed by Kalamazoo Sled Co., Kalamazoo, caught his hand in shaper and lost one finger. Was paid during time disabled. There is no way of thoroughly guarding the shaper.

No. 123.—January, 1896. H. Scott, age 25, single, machinist, in the employ of Kalamazoo Boiler & Engine Works, Kalamazoo, caught hand under lever of lathe and crushed two fingers. Was disabled five weeks, and received no wages during time disabled. There is no way of guarding the place where he was caught.

No. 180.—Dec., 1895. Reno Elson, age 35, married, employed on drill press, by Lee & Porter, Buchanan, caught his hand in cog gearings on press and crushed forefinger on left hand. Was disabled two weeks and received wages during time disabled.

No. 189.—Jan. 7, 1896. Frank Wright, age 17, engineer, employed by Comstock Mfg. Co., Comstock, killed, by being caught on unprotected jack shaft of engine.

No. 193.—Feb., 1896. George Hofacker, age 30, married, paper cutter, in the employ of Bardeen Paper Co., caught his right hand under paper knife and lost two fingers. Was disabled four weeks, and received insurance. There is no way to guard the knife on which he was caught.

No. 205.—Dec., 1896. Fred Minore, age 30, single, peeler in the employ of U. S. Baking Co., Lansing, caught his right hand under knife of cutter machine and lost two fingers. Was disabled six weeks, and received no wages during time disabled. This man was injured through his own carelessness. There is no way to guard the machine thoroughly.

No. 212.—March 23, 1896. E. G. Bailey, age 30, married, proprietor of Troy Laundry, Lansing, caught on line shaft while tightening a box when in motion, badly bruised. Was not disabled. The shaft is over head and does not need guards.

No. 222.—Jan. 10, 1896. John A. Underhill, age 49, married, a shaper in the employ of W. H. Rickard, Lansing, lost two fingers on left hand. Received wages during time disabled.

No. 227.—Sept. 9, 1896. Fred Clark, age 26, married, employed on tenon machine for Potter Mfg. Co., Lansing, crushed his hand while changing belt when machine was in motion. Was disabled three months, and received insurance.

No. 238.—Feb. 20, 1896. L. Lynn, age 55, married, slab sawyer, in employ of Lansing Spoke Co., Lansing, caught his right hand on saw and lost one finger. Was disabled six weeks. This man was injured through his own carelessness, as the saw was well guarded and on a table.

No. 301.—Feb. 1, 1896. William Hollon, age 32, married, employed on rip saw, for Page Bros. Buggy Co., Marshall, lost his forefinger on right hand through carelessness. Was disabled two weeks, and did not receive wages while disabled.

No. 358.—Two accidents were reported from this factory, but the particulars were not written up.

No. 418.—April 21, 1896. Frank Block, age 19, chore boy, employed by the Scharf Tag & Label Co., Ypsilanti, was killed by being caught on line shaft next to ceiling. Burial expenses paid by company. The machine was provided with loose pulleys, but the boy was upon a box next to the shaft for some unknown purpose.

THIRD DISTRICT.

L. C. F. HINTZ, *Deputy Inspector.*

SUMMARY OF WORK IN THIRD INSPECTION DISTRICT.

Office of Deputy Inspector,
Grand Rapids, November 28, 1896.

Hon. C. H. Morse, *Commissioner of Labor, Lansing, Mich.:*

Dear Sir—In compliance with your instructions, I herewith hand you a report of my work as Deputy Inspector of the 3d district since the law went into effect, September 1, 1893, and a brief statement of my work for 1896:

	1893.		1894.		1895.		1896.	
	Ordered.	Complied.	Ordered.	Complied.	Ordered.	Complied.	Ordered.	Complied.
Children under 14 discharged	8	8	15	15	40	40	20	20
Elevators guarded and repaired	31	18	39	19	51	31	42	22
Fire escapes	22	10	18	12	17	11	9	4
Hand rails and other stair protection	39	18	80	42	50	17	40	24
Guards for belts, cogs, saws, set screws, etc.	69	42	90	39	121	43	105	91
Doors changed to swing outward	18	11	5	4	2	3	......	......
Blower systems and extensions	32	11	33	14	15	8	19	10
New closets, separate closets and better sanitary conditions	12	3	24	15	15	10	16	12
Miscellaneous orders	10	7	15	10	18	10	10	8
Totals	241	128	319	170	329	167	261	191

Factories inspected in 1893	583
Factories revisited in 1893	100
Factories inspected in 1894	935
Factories revisited in 1894	238
Factories inspected in 1895	726
Factories revisited in 1895	401

Factories inspected in 1896	725
Factories revisited in 1896	266
Whole number of inspections since Sept. 1, 1893	2,969
Whole number of revisits since Sept. 1, 1893	1,005
Whole number of changes ordered since Sept. 1, 1893	1,146
Whole number of compliances reported since Sept. 1, 1893	650

The great hindrance to the work of 1896 has been the depression in business, and consequently quite a number of the most expensive changes have not been complied with, and in a number of these it was difficult to enforce our order as the factories were running only a part of the time. As the work of the factory inspector is being now fully understood and recognized it grows less difficult every year, and manufacturers that have built new factories are complying with the law without having their attention called to the same in a large number of cases, but still the vigilant eye of the State must be kept on all factories, as there are always changes being made, and especially where children are employed.

In only one case have I been obliged to resort to the law, and in this case the defendant pleaded guilty and complied at once, and in several other cases the aid of prosecuting attorneys have been called and compliances have followed without bringing the cases into court.

I have reported 53 accidents during the year, a majority of which were sustained by operatives of wood working machinery, which is generally considered the most dangerous to life and limb. Upon investigation as to the causes of these accidents I have found the largest part of them were caused by carelessness, or were wholly unavoidable. In only a few cases could they have been avoided by the employment of proper safeguards.

I am confident that with a return of prosperity to the manufacturing interests of the State, the laws sought to be enforced by this bureau will be more readily complied with, especially such as involve the expenditure of money. At the same time I am as confident the work of the factory inspectors will be increased and the necessity for their constant vigilance will be enlarged.

Respectfully submitted,

LOUIS C. F. HINTZ,

Deputy Inspector.

Inspection book No. 1.

TABLE No. 3.—

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
1	Jan. 20	Grand Rapids	F. Raniville	Belting and fly netting	run.	full
2	" 20	"	Michigan Spice Co.	Coffee and spices	"	"
3	" 20	"	Kelly Shirt Co	Shirts, collars and cuffs	"	"
4	" 20	"	Valley City Machine Works	Machinery and repairs.	"	"
5	" 20	"	Grand Rapids Wood Carving Co.	Furniture ornaments	"	"
6	" 20	"	Clark & Peterlein	Ivory & bone tur. & carv.	"	"
7	" 21	"	Barlow Bros.	Bl'nk books & book bind	"	"
8	" 21	"	Loomis & Onderdonk	Job printing	"	"
9	" 21	"	Chas. A. Coye	Tents and awnings	"	"
10	" 21	"	E. D. Fuller	Job printing	"	"
11	" 21	"	F. L. Noble	Photographs	"	"
12	" 21	"	Grand Rapids Printing Co.	Job printing	"	"
13	" 22	"	Hirth, Krause & Co.	Shoe uppers	"	"
14	" 22	"	Grand Rapids Lithographing Co.	Lithograph & book bind	"	"
15	" 22	"	Consolidated Street Ry. Co.	Elec. power and repairs	"	"
16	" 22	"	Nelson-Matter Furniture Co.	Furniture	"	"
17	" 23	"	Josiah J. Biggs	Upholstered goods	"	part
18	" 23	"	Free Coinage Independent	Newspaper	"	full
19	" 23	"	Butterworth & Lowe	Machinery	"	part
20	" 23	"	Peninsular Brass Co.	Brass castings	"	full
21	" 23	"	Mueller & Slack Co.	Upholstered furniture	"	"
22	" 23	"	Heyman & Co.	Showcases and up. fur.	"	"
23	" 23	"	E. J. Hamilton	Photographs	"	"
24	" 27	"	Monitor Vapor Eng. and Pow. Co.	Gas eng's and launches.	"	part
25	" 27	"	Champion Cash Register Co.	Cash registers	"	full
26	" 27	"	J. J. Koke & Co.	Fishing rods	"	part
27	" 27	"	Dygert Printing Co.	Job printing	"	full
28	" 27	"	Jas. A. Anderson & Co.	Furniture ornaments	"	"
29	" 28	"	Michigan Vapor Stove Co.	Vapor stoves	"	"
30	" 28	"	Bissell Carpet Sweeper Co.	Carpet sweepers	"	"
31	" 28	"	A. Leitelt Iron Works	Machinery and boilers	"	"
32	" 28	"	Elliotte Button Fastener Co.	Button fasteners	"	"
33	" 29	"	Grand Rapids Electrotype Co.	Electrotype	"	"
34	" 29	"	Peninsular Brass Co.	Brass finish. and plating	"	"
35	" 29	"	Groskopf Bros.	Trunks and valises	"	"
36	" 29	"	Union Bakery	Bread and pastry	"	"
37	" 29	"	Grand Rapids Cigar Co.	Cigars	"	"
38	" 29	"	New England Furniture Co.	Furniture	"	"
39	" 30	"	Valley City Milling Co.	Flour and feed	"	"
40	" 30	"	Globe Mills	" " "	"	"
41	" 30	"	Grand Rapids Edge Tool Works	Edge tools	"	"
42	" 30	"	Goshen Sweeper Co.	Carpet sweepers	"	"
43	" 30	"	Alexander Dodds	Spe. mach. & bicy. seats	"	"
44	" 31	"	Berkey & Gay Furniture Co.	Furniture & bicycle rims	"	"
45	" 31	"	Z. E. Allen	Furniture and baskets	"	"
46	Feb. 1	"	Millard Steam Laundry	Laundry work	"	"
47	" 1	"	Fiebig Wagon Co.	Wagons and repairs	"	"
48	" 1	"	Royal Furniture Co.	Furniture	"	"
49	" 1	"	G. R. Blow Pipe and Dust Ar. Co.	Blowpipes, etc	"	part
50	" 3	"	F. Letteller & Co.	General wood work	"	"

District No. 3. *L. C. F. Hintz, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity.	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water-closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	27	21	6	$850	....	....	......	10	§25	yes	yes	yes	yes	no	yes	yes	yes	....	yes	yes	....	1
60	60	6	5	1	225	....	....	......	10	§25	"	"	"	"	"	‖	"	"	....	"	"	....	2
54	54	38	8	16	400	....	....	......	9	§25	....	....	"	"	"	‖	"	"	....	"	"	....	3
60	60	5	5	....	400	....	....	......	10	§25	yes	yes	"	"	"	yes	"	"	....	"	....	....	4
60	60	20	20	....	700	....	....	......	10	§25	"	"	"	"	"	"	"	"	yes	"	....	....	5
60	60	7	3	....	156	....	....	......	10	§25	"	"	"	"	"	"	"	"	....	"	....	....	6
60	60	28	18	11	1,000	....	....	......	10	60	"	"	"	"	"	"	"	"	....	"	yes	....	7
60	60	11	10	1	420	...	....	......	10	60	"	"	"	"	"	"	"	no	....	"	"	....	8
60	60	20	5	5	375	....	....	......	10	60	....	....	"	"	"	‖	"	yes	....	"	"	....	9
60	60	3	2	1	110	....	....	......	10	60	....	....	"	"	"	‖	"	"	....	"	"	....	10
60	60	8	2	2	150	....	....	......	10	60	....	....	"	"	"	yes	....	....	....	"	"	....	11
60	60	5	4	....	200	....	....	......	10	60	....	....	"	"	"	‖	yes	yes	....	"	....	....	12
60	60	5	2	2	130	....	....	......	10	60	yes	yes	"	"	"	‖	"	"	....	"	yes	....	13
54	54	34	28	6	1,000	....	....	......	10	60	....	....	"	"	"	‖	"	"	....	"	"	....	14
60	60	48	48	....	2,280	....	....	......	10	50	....	....	"	"	"	yes	"	"	....	"	....	....	15
60	60	450	344	2	10,000	....	....	......	10	50	yes	yes	"	"	"	"	"	"	yes	"	yes	....	16
60	30	8	1	1	110	....	....	......	10	60	....	....	"	"	"	‖	....	....	....	"	no	....	17
60	60	4	4	....	200	....	....	......	10	60	....	....	"	"	"	‖	....	....	....	"	....	....	18
60	54	85	25	....	1,400	....	....	......	10	60	....	....	"	"	"	‖	yes	yes	....	"	....	....	19
60	60	4	4	....	140	....	....	......	10	50	....	....	....	"	"	‖	....	"	....	no	....	....	20
60	60	40	30	2	1,200	....	10	yes	10	50	yes	no	yes	"	"	yes	....	....	....	yes	yes	....	21
60	60	14	8	...	400	....	....	......	10	50	"	yes	"	"	"	"	....	....	....	"	....	....	22
60	60	8	3	2	200	....	....	......	10	60	...	....	"	"	"	"	....	....	....	"	yes	....	23
60	54	26	8	1	835	....	....	......	10	60	yes	no	....	"	"	‖	yes	yes	....	"	"	....	24
60	60	25	5	3	600	....	....	......	10	50	"	yes	yes	"	"	yes	"	"	yes	"	"	....	25
60	54	7	5	2	200	....	....	......	10	50	"	"	"	"	"	"	"	"	"	"	"	....	26
60	60	3	2	1	100	....	....	......	10	60	"	"	"	"	"	"	"	"	....	"	"	....	27
60	60	9	8	...	280	....	....	......	10	50	"	"	"	"	yes	"	"	"	yes	"	....	....	28
60	60	65	31	1	1,250	....	....	......	10	50	"	no	"	"	no	"	"	"	"	"	yes	....	29
60	60	275	144	31	7,000	....	....	......	10	50	"	yes	"	"	yes	"	"	"	"	"	"	....	30
60	60	90	70	....	3,000	....	....	......	10	60	"	"	"	"	no	"	"	"	.. .	"	....	1	31
60	60	35	25	3	1,500	....	....	......	10	60	"	"	"	"	"	"	"	no	....	"	yes	....	32
60	60	8	8	....	325	....	....	......	10	60	"	"	"	"	"	"	"	yes	....	"	....	....	33
60	60	16	10	1	325	....	....	......	10	60	"	"	"	"	"	"	"	"	yes	"	....	....	34
60	60	12	8	....	300	....	....	......	10	60	....	....	"	"	"	‖	....	....	....	"	....	....	35
60	60	8	8	....	375	....	....	......	10	60	....	....	"	"	"	‖	....	....	....	"	....	....	36
48	48	5	4	1	110	....	....	......	8	60	....	....	....	"	"	‖	....	....	....	"	yes	....	37
60	60	250	198	2	4,500	....	3	yes	10	50	yes	yes	yes	"	"	yes	yes	yes	yes	"	"	1	38
*	*	30	29	1	†2,400	....	....	......	10	60	....	....	"	"	"	‖	"	"	....	"	"	....	39
*	*	8	8	....	‡	....	....	......	10	60	....	....	"	"	"	‖	"	"	...	"	....	....	40
60	60	14	9	....	350	....	....	......	10	§30	....	....	"	"	"	‖	"	"	....	"	....	....	41
60	60	80	44	6	1,275	...	....	......	10	60	yes	yes	"	"	"	no	"	"	yes	"	yes	...	42
60	60	15	12	....	360	....	....	......	10	50	....	....	"	"	"	‖	"	"	....	"	....	....	43
60	60	565	330	1	15,000	....	...	......	10	60	yes	no	"	"	"	yes	"	"	yes	"	yes	....	44
60	60	53	53	....	1,450	....	2	yes	10	50	"	yes	"	"	"	"	"	"	"	"	....	....	45
60	60	7	3	4	275	....	....	......	10	60	....	....	....	"	"	‖	"	"	....	"	no	....	46
60	60	10	7	....	260	....	....	......	10	50	yes	no	yes	"	"	‖	....	....	...	"	....	....	47
60	60	175	130	1	3,700	....	1	no	10	50	"	yes	"	"	"	yes	yes	yes	yes	"	yes	1	48
60	54	20	8	....	400	....	....	......	10	60	....	....	....	"	"	‖	....	....	....	"	....	....	49
60	48	40	25	....	1,500	....	....	......	10	50	....	....	yes	"	"	yes	yes	yes	yes	"	....	....	50

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* 144 hours-running day and night.
† This includes the pay roll of the Globe and Model Mills which are run by the same company.
‡ Included in pay roll of Valley City Milling Co.
§ Permit given by inspector.
‖ None required.

Inspection book No. 2. **TABLE No. 3.—CONTINUED.—**

No. given factory for 18[illegible].	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
51	Feb. 3	Grand Rapids	Sintz Gas Engine Co.	Gas engines & launches	run.	full
52	“ 3	“	Union Foundry Co.	Brass and iron castings.	“	“
53	“ 3	“	Christenson Baking Co.	Crackers and cakes	“	“
54	“ 3	“	Paine Bedding Co.	Upholstered furniture, bedding, etc.	“	part
55	“ 3	“	H. N. Hall Cabinet Co.	Furniture	“	full
56	“ 4	“	A. A. Greil	Cisterns, casks and kegs	“	part
57	“ 4	“	Chappell & Telzrow	Soap, bluing & ammonia	“	“
58	“ 4	“	Ryan Rattan Chair Co.	Rattan goods	“	full
59	“ 4	“	Priestley Wagon & Sleigh Co.	Sleighs and screens	idle	......
60	“ 4	“	Grand Rapids Piano Case Co	Piano cases	run.	full
61	“ 5	“	Oriel Cabinet Co.	Furniture	“	“
62	“ 6	“	Hoebeke & Co.	Sorted rags	“	part
63	“ 6	“	Central Boiler Works	Boilers, etc.	“	“
64	“ 6	“	Waddell Manufacturing Co.	Furniture ornaments	“	full
65	“ 6	“	Chicago Laundry	Laundry work	“	“
66	“ 6	“	Hill Domestic Bakery	Bread and pastry	“	“
67	“ 7	“	Dupree & Hewitt	Lumber, boxes and interior finish.	“	part
68	“ 7	“	Dale & Brethom	Excelsior	“	full
69	May 18	“	Michigan Barrel Co.	Bent and rim works	“	“
70	“ 18	“	I. L. Quimby	Organ stock, etc.	“	“
71	Feb. 7	“	Grand Rapids Chair Co	Furniture	“	“
72	“ 10	“	F. L. Noble	Photographs	“	“
73	“ 10	“	A. Tusch	Cigars	“	“
74	“ 10	“	C. G. Baisch	Cutlery and gun repairs	“	“
75	“ 10	“	C. A. Scheufler	Sheet metal & pipe w'ks	“	“
76	“ 10	“	F. W. Emmer	Wagons and repairs	“	“
77	“ 11	“	*Grand Rapids Brewing Co.	Lager beer	“	“
78	“ 11	“	John J Blickle	Cigars	“	“
79	“ 11	“	John E. Kenning & Co.	“	“	“
80	“ 11	“	Paul Eifert	Harnesses and trunks	“	“
81	“ 11	“	David Forbes	Stencils, stamps and dies	“	“
82	“ 12	“	Seymour & Muir Printing Co,	Job printing	“	“
83	“ 12	“	Vrijheids Banier	Printed matter	“	“
84	“ 12	“	New York Biscuit Co,	Crackers and cakes.	“	“
85	“ 12	“	Practical Farmer Co.	Agricultural journal	“	“
86	“ 12	“	West Michigan Printing Co.	Job printing	“	“
87	“ 12	“	Hodelack & Vanselow	Wood carving	“	“
88	“ 13	“	F. Van Driele & Co.	Flour and feed	“	“
89	“ 13	“	U. S. Cigar Co.	Cigars	“	“
90	“ 13	“	Weatherly & Pulte	Sheet metal & pipe works	“	part
91	“ 13	“	Grand Rapids Democrat	Newspaper	“	full
92	“ 13	“	De Standard	“	“	“
93	“ 13	“	Reynders Printing Co.	Job printing	“	“
94	“ 14	“	The Workman	Labor journal and job printing.	“	“
95	“ 14	“	The Germania	Newspaper & job print'g	“	“
96	“ 14	“	A. J. Tucker	Book binding	“	“
97	“ 14	“	Herman A. Toren	Job printing	“	“
98	“ 14	“	Kuppenheimer Bros.	Cigars	“	“
99	“ 17	“	White Printing Co.	Printed matter	“	part
100	“ 17	“	Grand Rapids Corset Co.	Corsets	idle	......

* Factory being rebuilt, not fully in operation.

District No. 3. *L. C. F. Hintz, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection?	No. given factory for 1896.
60	60	60	30	----	$2,000	----	----	------	10	45	yes	no	yes	yes	no	†	yes	yes	----	yes	----	----	51
60	60	28	22	----	1,200	----	----	------	10	50	"	yes	"	"	"	†	"	"	yes	"	----	----	52
54	54	10	7	----	330	----	----	------	9	50	----	----	----	"	"	†	"	"	----	"	----	----	53
60	36	37	15	2	800	----	1	no	10	60	yes	yes	yes	"	"	yes	"	"	----	"	yes	----	54
60	60	33	13	----	600	----	----	------	10	50	"	no	"	"	"	"	"	"	yes	"	----	----	55
60	42	4	2	----	100	----	----	------	10	60	----	----	----	"	"	†	----	----	----	"	----	----	56
60	48	4	3	----	100	----	----	------	10	60	----	----	yes	"	"	†	----	yes	----	"	----	----	57
60	60	16	4	2	350	----	----	------	10	60	yes	----	"	"	"	†	----	----	----	"	yes	----	58
60	--	50	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	59
60	60	80	60	----	2,300	----	----	------	10	50	yes	yes	yes	yes	no	no	yes	no	yes	yes	----	----	60
60	60	375	367	8	11,000	----	8	*	10	50	"	"	"	"	"	yes	"	yes	"	"	yes	4	61
60	54	14	3	8	280	----	----	------	10	60	----	----	----	"	"	†	----	----	----	"	"	----	62
60	54	14	8	----	625	----	----	------	10	60	----	----	yes	"	"	†	yes	yes	----	"	----	----	63
60	60	82	82	----	1,800	----	----	------	10	50	----	----	"	"	"	yes	"	no	yes	"	----	1	64
60	60	12	5	4	260	----	----	------	10	60	----	----	----	"	"	†	"	yes	----	"	yes	----	65
60	60	15	14	1	650	----	----	------	10	60	----	----	yes	"	"	†	----	----	----	"	----	----	66
60	54	19	13	----	700	----	----	------	10	50	yes	no	no	"	"	†	yes	no	yes	"	----	----	67
54	54	15	15	----	400	----	1	yes	10	50	----	----	----	"	"	†	"	yes	----	"	----	----	68
60	60	250	180	----	5,500	----	12	*	10	50	----	----	yes	"	yes	†	"	"	yes	"	----	1	69
60	60	44	32	----	1,200	----	----	------	10	50	----	----	----	"	no	†	"	"	"	"	----	1	70
60	60	300	298	2	10,500	----	----	------	10	50	yes	yes	no	"	"	yes	"	"	"	"	yes	----	71
60	60	4	3	1	200	----	----	------	10	60	----	----	yes	"	"	"	----	----	----	"	no	----	72
48	48	6	5	1	250	----	----	------	8	60	----	----	"	"	"	†	----	----	----	"	yes	----	73
60	60	4	3	----	150	----	----	------	10	50	----	----	no	"	"	†	yes	yes	----	"	----	----	74
54	54	7	7	----	225	----	----	------	9	60	----	----	----	"	"	†	----	----	----	"	----	----	75
60	60	7	5	----	235	----	----	------	10	60	----	----	----	"	"	†	----	----	----	"	----	----	76
60	60	38	38	----	2,825	----	----	------	10	60	----	----	----	----	----	----	----	----	----	----	----	----	77
48	48	3	2	----	75	----	----	------	8	60	----	----	yes	yes	no	†	----	----	----	yes	----	----	78
48	48	27	7	2	325	----	----	------	8	60	----	----	"	"	"	†	----	----	----	"	yes	----	79
60	60	6	3	----	110	----	----	------	10	50	----	----	"	"	"	†	----	----	----	"	----	----	80
60	60	4	4	----	230	----	----	------	10	60	----	----	"	"	"	†	----	----	----	"	----	----	81
54	54	20	19	1	700	----	----	------	9	60	----	----	"	"	"	†	yes	yes	----	"	yes	----	82
60	60	4	4	----	180	----	1	no	10	60	----	----	"	"	"	†	----	----	----	"	----	----	83
60	60	90	38	37	2,500	----	1	"	10	45	yes	yes	"	"	"	yes	yes	yes	----	"	yes	----	84
60	60	5	4	----	175	----	----	------	10	60	----	----	"	"	"	†	"	no	----	"	----	----	85
60	60	16	8	----	500	----	----	------	10	60	----	----	"	"	"	†	"	yes	----	"	----	----	86
60	60	9	5	----	250	----	----	------	10	60	----	----	----	"	"	†	----	----	----	"	----	----	87
60	60	5	5	----	170	----	----	------	10	50	----	----	yes	"	"	†	yes	yes	----	"	----	----	88
48	48	25	13	5	600	---	----	------	8	60	yes	yes	"	"	"	yes	----	----	----	"	yes	----	89
54	48	55	42	----	2,000	----	----	------	9	50	"	----	"	"	"	†	yes	yes	----	"	----	----	90
60	60	50	43	3	3,000	----	----	------	10	60	----	----	"	"	"	†	"	"	----	"	yes	----	91
60	60	5	5	----	225	----	----	------	10	60	----	----	"	"	"	†	----	----	----	"	----	----	92
60	60	9	7	----	200	----	1	yes	10	60	----	----	"	"	"	†	yes	yes	----	"	----	----	93
54	54	10	9	1	500	----	----	------	9	60	----	----	"	"	"	†	"	"	----	"	yes	----	94
60	60	10	9	----	400	----	----	------	10	60	----	----	"	"	"	†	"	"	----	"	----	----	95
60	60	10	2	5	140	----	----	------	10	60	----	----	"	"	"	yes	----	----	----	"	yes	----	96
60	60	4	3	----	125	----	----	------	10	60	----	---	"	"	"	†	yes	yes	----	"		----	97
48	48	6	5	1	300	----	----	------	8	60	----	----	----	"	"	†	----	----	----	"	yes	----	98
60	57	20	11	1	400	----	1	yes	10	60	----	----	yes	"	"	†	yes	yes	----	"	"	1	99
60	--	100	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	100

* Not all. † None required.

Inspection book No. 3. TABLE No. 8.—CONTINUED.—

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
101	Feb. 17	Grand Rapids	J. Wilhelm & Co.	Shoes and shoe uppers	run.	full
102	" 17	"	H. Schneider Co	Cigars	"	"
103	" 17	"	Samuel Sharpsteen	Photographs	"	"
104	" 18	"	Gardiner & Baxter	Shirts and laundry w'k.	"	"
105	" 18	"	Mich. Cyclist Publishing Co.	Printed matter	"	"
106	" 18	"	G. Zwingeberg	Fur garments	"	"
107	" 18	"	U. G. Clark	Printed matter	"	"
108	" 18	"	Grand Rapids Cloth Casket Co.	Caskets	"	"
109	" 19	"	E. J. Herrick	Confectionery	"	"
110	" 19	"	Scott Bros.	Bread and pastry	"	"
111	" 19	"	John Cummings	Carriages	"	part
112	" 19	"	A. J. Brown & Co.	Seeds	"	full
113	" 19	"	Alaska Fur Co.	Fur garments	"	"
114	" 19	"	Chas. E. Heath	Photographs	"	"
115	" 20	"	Evening Press	Newspaper	"	"
116	" 20	"	Stanton Printing Co.	Printed matter	"	"
117	" 20	"	Reed Engraving Co.	Engravings & etchings.	"	"
118	" 20	"	F. Joe Lamb	Electrical sup. & repairs	"	"
119	" 20	"	S. T. Kinsey	Shirts, collars and cuffs	"	"
120	" 20	"	Rindge, Kalmbach & Co.	Boots and shoes	"	"
121	" 21	"	F. J. Sokup	Sheet metal work	"	part
122	" 21	"	Tisch Bros.	Cigar boxes	"	full
123	" 21	"	Automatic Cycle Seat Co.	Bicycle seats	"	"
124	" 21	"	Grand Rapids Knitting Co.	Underwear	"	"
125	" 21	"	Grand Rapids Paper Box Co.	Paper boxes	"	"
126	" 21	"	Mich. Iron Works	Machinery & castings	"	part
127	" 24	"	DeLong & Barstow	Sheet metal work	"	full
128	" 24	"	A. Hirth & Son	Cut stone	"	"
129	" 24	"	Ideal Clothing Co.	Pants, shirts & overalls	"	"
130	" 24	"	Jennings & Smith	Extracts, perfumes, etc.	"	"
131	" 24	"	W. C. Hopson & Co.	Sheet metal work	"	part
132	" 25	"	Grand Rapids Herald	Newspaper	"	full
133	" 25	"	Val. City Engraving & Print. Co	Engraving and printing	"	"
134	" 25	"	Studley & Barkley	Belting	"	"
135	" 25	"	Spring & Co.	Dresses, carp'ts & shades	"	"
136	" 26	"	Foster, Stevens & Co.	Sheet metal work, etc.	"	"
137	" 26	"	Edward Struensee Co.	Harnesses	"	"
138	" 26	"	Gd. Rps. Paint & Wood Fin Co.	Paints, etc.	"	"
139	" 26	"	Wm. A. Berkey Furniture Co.	Furniture	"	"
140	" 26	"	Arthur Wood Carriage Co.	Carriages and buggies	"	"
141	" 26	"	F. J. Everhart	Saws	"	"
142	" 26	"	A. Hanish	Harnesses and trunks	"	"
143	" 27	"	John P. Platte	Umbrellas and parasols	"	"
144	" 27	"	Tradesman Co.	Engraving and painting	"	"
145	" 27	"	Grand Rapids Refrigerator Co.	Refrigerators	"	"
146	" 27	"	Edison Light Co.	Electricity	"	"
147	" 28	"	Hazeltine & Perkins Drug Co.	Drugs	"	"
148	" 28	"	Voight Herpolsheimer & Co.	Overalls, carp. & shades	"	"
149	" 28	"	J. W. York & Son	Musical instruments	"	"
150	" 28	"	A. E. Brooks & Co.	Confectionery	"	part

District No. 3. ***L. C. F. Hintz, Deputy Inspector.***

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	9	6	3	$300	----	1	no	10	60	----	----	----	yes	no	‡	yes	yes	yes	yes	no	----	101
48	48	20	7	8	657	----	----	------	8	60	yes	no	yes	"	"	yes	----	----	----	"	yes	----	102
48	48	6	3	2	200	----	----	------	8	60	----	----	"	"	"	"	----	----	----	"	"	----	103
60	60	90	15	60	2,200	----	----	------	10	60	yes	----	"	"	"	"	yes	no	----	"	"	----	104
60	60	8	7	1	225	----	----	------	10	60	----	----	"	"	"	‡	----	----	----	"	"	----	105
54	54	22	2	4	300	----	----	------	9	60	----	----	"	"	"	‡	----	----	----	"	"	----	106
60	60	6	6	----	200	----	1	no	10	60	----	----	----	"	"	‡	yes	yes	----	"	----	----	107
60	60	4	4	----	150	----	----	------	10	50	----	----	----	"	"	‡	----	----	----	"	----	----	108
60	60	6	8	1	200	----	----	------	10	60	yes	no	yes	"	"	yes	----	----	----	"	yes	----	109
60	60	9	4	----	200	----	----	------	10	60	----	----	"	"	"	‡	----	----	----	"	----	----	110
60	54	15	7	----	325	----	----	------	10	60	----	----	"	"	"	‡	yes	yes	----	"	----	----	111
60	60	24	4	20	800	----	----	------	10	60	yes	yes	"	"	"	yes	"	"	----	"	yes	----	112
60	60	5	2	----	100	----	----	------	10	60	----	----	"	"	"	‡	----	----	----	"	----	----	113
54	54	6	3	1	100	----	----	------	9	60	----	----	"	"	"	yes	----	----	----	"	yes	----	114
60	60	50	48	2	3,000	----	1	no	10	60	yes	----	"	"	"	‡	yes	yes	----	"	"	----	115
60	60	25	15	----	1,000	----	1	"	10	60	----	----	"	"	"	‡	"	"	----	"	----	----	116
54	54	9	4	3	200	----	----	------	9	60	----	----	"	"	"	‡	"	"	----	"	yes	----	117
60	60	2	2	----	100	----	----	------	10	60	----	----	"	"	"	‡	"	"	----	"	----	----	118
60	60	45	4	26	750	----	----	------	10	60	----	no	"	"	"	‡	"	"	----	"	yes	----	119
60	60	74	60	14	3,000	----	1	yes	10	60	yes	yes	"	"	"	yes	"	"	yes	"	"	----	120
60	54	24	10	----	400	----	----	------	10	60	"	----	----	"	"	‡	----	----	----	"	----	----	121
60	60	14	5	8	300	----	2	yes	10	60	"	----	yes	"	"	yes	yes	yes	yes	"	yes	2	122
60	60	14	12	2	500	----	----	------	10	60	"	yes	"	"	"	"	"	"	----	"	"	----	123
54	54	23	3	20	500	----	----	------	9	60	"	"	"	"	"	"	"	"	----	"	"	----	124
60	60	60	12	28	667	----	3	†	10	60	"	no	"	"	"	"	"	"	----	"	"	----	125
60	54	50	20	----	800	----	----	------	10	60	----	----	"	"	"	‡	"	"	----	"	----	----	126
60	60	7	2	----	150	----	----	------	10	60	----	----	----	"	"	‡	----	----	----	"	----	----	127
54	54	25	2	----	500	----	----	------	9	60	----	----	----	"	"	‡	yes	yes	----	"	----	----	128
60	60	100	10	55	1,200	----	----	------	10	60	yes	yes	yes	"	"	yes	"	no	----	"	yes	----	129
60	60	25	8	5	425	----	----	------	10	60	"	no	"	"	"	‡	----	----	----	"	"	----	130
60	48	16	7	1	300	----	----	------	10	60	no	"	"	"	"	‡	----	----	----	"	"	----	131
60	60	46	44	2	2,700	----	----	------	10	60	yes	----	"	"	"	‡	yes	yes	----	"	"	----	132
60	60	46	28	4	1,500	----	----	------	10	60	----	----	"	"	"	yes	"	"	----	"	"	----	133
60	60	6	3	----	156	----	----	------	10	60	yes	yes	"	"	"	"	----	----	----	"	----	----	134
60	60	60	1	2	1,200	----	----	------	10	60	"	"	"	"	"	"	----	----	----	"	yes	----	135
60	60	11	11	----	650	----	----	------	10	60	"	"	"	"	"	"	----	----	----	"	----	----	136
60	60	10	5	----	400	----	----	------	10	60	----	----	"	"	"	‡	----	----	----	"	----	----	137
60	60	5	4	----	230	----	----	------	10	60	yes	yes	"	"	"	‡	yes	yes	----	"	----	----	138
60	60	185	124	----	5,100	----	----	------	10	50	"	no	"	"	"	yes	"	"	----	"	----	----	139
60	60	40	80	----	800	----	----	------	10	50	----	----	"	"	"	‡	"	"	----	"	----	----	140
60	60	4	4	----	156	----	----	------	10	60	----	----	----	"	"	‡	----	----	----	"	----	----	141
60	60	8	4	----	200	----	----	------	10	50	----	----	----	"	"	‡	----	----	----	"	----	----	142
60	60	9	1	1	200	----	----	------	10	60	yes	yes	yes	"	"	no	yes	yes	----	"	yes	----	143
60	60	35	23	12	1,200	----	----	------	10	60	"	"	"	"	"	yes	"	"	----	"	"	----	144
60	60	250	202	----	4,400	----	4	yes	10	50	"	"	"	"	"	"	"	"	yes	"	----	----	145
*	*	22	21	1	1,100	----	----	------	10	60	----	----	----	"	"	‡	"	no	----	"	yes	----	146
60	60	2	2	----	116	----	----	------	10	60	yes	yes	yes	"	"	yes	----	----	----	"	----	----	147
60	60	32	10	12	280	----	----	------	10	60	"	no	"	"	"	"	----	----	----	"	yes	----	148
60	60	15	9	----	400	----	----	------	10	50	----	----	"	"	"	"	yes	yes	----	"	----	----	149
60	54	25	9	6	400	----	----	------	10	60	yes	yes	"	"	"	"	----	"	----	"	yes	----	150

*168 hours–running all the time. † Not all. ‡ None required.

Inspection book No. 4.

TABLE No. 3.—Continued.—

No. given factory for 1896.	Date of inspection.		Location.	. Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
151	Feb.	28	Grand Rapids	C. Bakker	Clothing	run.	full
152	Mar.	4	"	Putnam Candy Co.	Confectionery	"	part
153	"	4	"	Dean Printing Co.	Printed matter	"	full
154	"	4	"	J. Chilver & Co.	Book binding	"	"
155	"	4	"	Grand Rapids Engraving Co.	Engraving and etching	"	"
156	"	5	"	Miller Furnace Co.	Furnaces	"	"
157	"	5	"	Charles Dawson	Carriages and repairs	"	"
158	"	5	"	Hensen & Johnson	Printed matter	"	"
159	"	5	"	Chas. Hoffman	Bread, pastry & confec.	"	"
160	"	5	"	Enterprise Neckwear Co.	Neckwear	"	"
161	"	6	"	Rookus Printing House	Printed matter	"	"
162	"	6	"	Grand Rapids Shirt Factory	Shirts, collars and cuffs	"	"
163	"	6	"	VanDenberg Manufacturing Co.	Harnesses	"	"
164	"	6	"	James McGregor	Cleaning and dyeing	"	part
165	"	6	"	A. S. Davis Co.	Cigars	"	full
166	"	6	"	Langereis & DeKoning	Printed matter	"	"
167	"	7	"	Geo. G. Steketee	Patent medicine	"	"
168	"	7	"	Gd. Rapids Wooden Shoe Factory	Wooden shoes	"	"
169	"	7	"	Michigan Brush Co.	Brushes	"	"
170	"	7	"	James Stewart	Cigars	"	"
171	"	9	"	Grand Rapids Rug Co.	Carpets and rugs	"	"
172	"	9	"	Valley City Shirt Factory	Shirts and shirtwaists	"	"
173	"	9	"	F. L. Blake	Bread and cakes	"	"
174	"	9	"	G. J. Johnson	Cigars	"	"
175	"	9	"	Jeltes, Dregge & Co.	General woodwork	"	part
176	"	9	"	Wm. Brummeler & Sons	Tinware & sorted rags	"	full
177	"	10	"	American Steam Laundry	Laun. w'k & carpet cl.	"	"
178	"	10	"	Cycloid Cycle Co.	Bicycles	"	"
179	"	10	"	Grand Rapids Monument Co.	Monuments	"	"
180	"	10	"	Heth Bros.	Sheet metal & mach. w'k	"	"
181	"	11	"	Wm. H. Gibson	Monuments	"	"
182	"	11	"	Patterson Furnace Co.	Furnaces	idle	......
183	"	11	"	Mich. Fire Ladder & Engine Co.	Fire apparatus	"	......
184	"	11	"	Granite Pressed Brick Co.	Pressed brick	"	......
185	"	11	"	C. H. Fields	Sand brick	"	......
186	"	12	"	Rowson Bros. & Co.	General woodwork	run.	part
187	"	12	"	E. D. Caswell	Feed	"	full
188	"	12	"	Gd. Rapids Pack'g & Provis'n Co.	Smoked & salted meats	"	"
189	"	12	"	Constantine Morton	Dressed lumber	idle	......
190	"	12	"	G. R. & I. R. R. Car Shops	Locomotive & car rep.	run.	part
191	"	13	"	Vulcan Iron Works	R. R. castings	"	full
192	"	13	"	Standard Cabinet Co.	Tables, etc.	"	"
193	"	13	"	Geo. R. Reeves	Maple flooring, etc.	"	"
194	"	13	"	S. P. Swartz	General woodwork	idle	......
195	"	13	"	H. Rademaker & Sons	Croquet sets and bats	run.	full
196	"	13	"	Central Furniture Co.	Tables, desks, etc.	"	part
197	"	16	"	Sligh Furniture Co.	Furniture	"	full
198	"	16	"	Sligh Bicycle Co.	Bicycles	"	"
199	"	16	"	Watson & Frost	Feed	"	"
200	"	16	"	Jacob Reelman	Dress'd lumber & shing.	"	"

District No. 3. *L. C. F. Hintz, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	12	1	3	$200	----	----	------	10	60	----	----	yes	yes	no	*	---	----	----	yes	yes	----	151
60	50	150	48	23	2,500	----	----	------	10	60	yes	yes	"	"	"	yes	yes	yes	----	"	"	----	152
60	60	50	26	9	1,300	----	----	------	10	60	"	"	"	"	"	"	"	"	----	"	no	----	153
60	60	30	9	21	800	----	----	------	10	60	"	"	"	"	"	"	"	"	----	"	yes	----	154
54	54	30	26	1	1,200	----	----	------	9	60	"	"	"	"	"	"	"	no	----	"	"	----	155
60	60	8	3	----	300	----	----	------	10	60	----	----	"	"	"	"	----	----	----	"	----	----	156
60	60	8	6	----	240	----	----	------	10	60	----	----	----	"	"	*	----	----	----	"	----	----	157
60	60	9	8	----	280	----	----	------	10	60	----	----	yes	"	"	*	yes	yes	----	"	----	----	158
60	60	5	4	1	200	----	----	------	10	60	----	----	"	"	"	*	"	"	yes	"	yes	----	159
60	60	25	4	14	600	----	----	------	10	60	yes	yes	"	"	"	yes	----	----	----	"	"	----	160
60	60	12	7	3	250	----	----	------	10	60	"	no	"	"	"	no	no	no	----	"	"	----	161
60	60	37	3	30	700	---	----	------	10	60	"	"	"	"	"	"	yes	yes	----	"	"	----	162
60	60	30	6	----	600	----	----	------	10	50	"	yes	"	"	"	yes	----	----	----	"	----	----	163
60	48	13	7	3	300	----	----	------	10	60	---	----	"	"	"	*	----	yes	---	"	yes	----	164
48	48	10	3	----	200	----	----	------	8	60	----	----	"	"	"	*	----	----	----	"	----	----	165
60	60	5	4	----	80	----	---	------	10	60	----	----	----	"	"	*	yes	yes	----	"	----	----	166
54	54	5	2	1	100	----	---	------	9	60	yes	----	yes	"	"	*	----	---	----	"	yes	----	167
60	60	6	4	----	175	----	----	------	10	60	----	----	---	"	"	*	---	----	---	"	---	----	168
60	60	10	5	5	360	----	---	------	10	50	----	----	yes	"	"	*	yes	yes	----	"	yes	----	169
48	48	4	2	1	100	----	----	------	8	60	----	----	"	"	"	*	---	----	---	"	"	----	170
60	60	7	3	1	150	----	----	------	10	60	----	----	"	"	"	*	---	----	---	"	"	----	171
60	60	8	----	4	96	----	----	------	10	60	----	----	----	"	"	*	---	----	---	---	"	----	172
60	60	16	15	1	800	----	----	------	10	60	yes	----	yes	"	"	*	---	---	---	yes	"	----	173
54	54	30	11	19	850	----	----	------	9	60	----	----	"	"	"	*	---	----	---	"	"	----	174
60	54	22	7	1	375	----	----	------	10	50	----	----	"	"	"	*	yes	yes	yes	"	----	----	175
60	60	30	10	4	500	----	---	------	10	50	---	----	"	"	"	*	"	"	----	"	no	----	176
60	60	80	18	47	2,275	----	----	------	10	60	yes	yes	"	"	"	*	"	"	----	"	yes	----	177
60	60	28	27	1	1,000	----	----	------	10	50	"	"	"	"	"	*	"	"	no	"	"	----	178
60	60	4	3	----	200	----	----	------	10	60	----	----	----	"	"	*	----	---	----	"	----	----	179
60	60	8	5	----	250	----	----	------	10	60	----	----	----	"	"	*	yes	yes	----	"	----	----	180
60	60	5	1	----	125	----	----	------	10	60	----	---	----	"	"	*	----	----	----	"	----	----	181
60	--	10	----	----	------	----	----	------	----	----	----	---	----	----	----	----	----	----	---	----	----	----	182
60	--	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	183
60	--	10	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	184
60	--	10	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	185
60	48	125	67	----	2,500	----	----	------	10	50	yes	no	no	yes	no	yes	yes	no	yes	yes	----	----	186
60	60	5	5	----	175	----	----	------	10	50	---	----	yes	"	"	*	"	yes	----	"	----	----	187
60	60	20	5	----	300	----	----	------	10	60	yes	no	"	"	"	*	"	"	----	"	----	----	188
60	--	25	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	---	----	----	189
60	54	369	369	----	15,675	----	----	------	10	60	----	----	----	yes	no	*	yes	yes	yes	yes	---	----	190
60	60	16	11	----	750	----	----	------	10	†30	---	----	----	"	"	*	"	"	---	"	---	----	191
60	60	20	15	----	300	----	----	------	10	50	----	----	yes	"	"	*	"	"	yes	"	yes	1	192
60	60	25	16	----	400	----	----	------	10	50	----	----	"	"	"	*	"	no	"	"	"	----	193
60	--	50	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	194
60	60	60	40	----	1,350	----	----	------	10	50	----	----	----	yes	no	*	yes	yes	----	yes	----	1	195
60	54	25	25	----	600	----	----	------	10	50	----	----	yes	"	"	yes	"	"	yes	"	----	----	196
60	60	200	157	1	5,153	----	----	------	10	60	yes	no	"	"	"	"	"	"	"	"	yes	1	197
60	60	100	38	----	2,000	----	----	------	10	60	"	yes	"	"	"	"	"	"	no	"	----	----	198
60	60	307	6	----	300	----	----	------	10	60	----	----	----	"	"	*	"	"	----	"	----	----	199
60	60	15	8	----	300	----	----	------	10	50	----	----	yes	"	"	*	"	"	yes	"	----	----	200

† Permit given by inspector. * None required.

Inspection book No. 5. **TABLE No. 8.—Continued.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
201	Mar. 16	Grand Rapids	Henry Kortlander	Barrels and kegs	run.	part
202	" 17	"	Palace Steam Laundry	Laundry work	"	full
203	" 17	"	C. W. Fox & Co.	Wood slates & bl'k board	"	......
204	" 17	"	Grand Rapids Tent & Awning Co.	Tents and awnings	idle	"
205	" 17	"	Daniel Lynch	Bak'g powd'r & extracts	run.	full
206	" 17	"	K. Dykema & Son	Feed	"	"
207	" 18	"	Russell & Simmons	Carriages, wag's & repa's	"	"
208	" 18	"	Grand Rapids Gas Co.	Gas and coke	"	"
209	" 18	"	Grand Rapids Felt Boot Co.	Felt boots	"	part
210	" 18	"	Luce Furniture Co.	Furniture	"	full
211	" 19	"	Michigan Chair Co.	"	"	"
212	" 19	"	Stickley Bros. Co.	Chairs	"	"
213	" 19	"	Retting & Sweet	Parlor furniture	"	"
214	" 19	"	Anti-Kalsomine Co.	Wall finish	"	"
215	" 19	"	American Carving & M'f'g. Co.	Carved mouldings	"	"
216	" 20	"	Grand Rapids Brick Co.	Brick	idle	......
217	" 20	"	Alabastine Co.	Plaster and stucco	run.	full
218	" 20	"	F. Godfrey & Bro.	" "	"	part
219	" 20	"	Grand Rapids Glue Co.	Glue, fertilizers and soap	"	full
220	" 20	"	*Michigan Glue Co.	Glue	idle	......
221	" 23	"	Hake Manufacturing Co.	Furnit'e ornaments, etc.	run.	full
222	" 23	"	John Mack	Carriag's & sleigh woods	idle	......
223	" 23	"	Eureka Cabinet Co.	Plumbers' wood work	run.	full
224	" 23	"	Grand Rapids Desk Co.	Desks	"	"
225	" 24	"	C. T. Campbell	Brooms	"	"
226	" 24	"	A. J. Karreman	General woodwork	"	part
227	" 25	"	Mills & Lacy Manufacturing Co.	Embalming fluid	"	full
228	" 25	"	Durfee Embalming Fluid Co.	" "	"	"
229	" 25	"	Moseley Bros.	Beans	"	"
230	" 25	"	Egbert Wonnink	General woodwork	"	"
231	Apr. 1	"	Consolidated Street Railway Co.	Cars repaired & painted	"	"
232	" 1	"	Grand Rapids Consolidated Brick & Tile Co.	Brick	idle	......
233	" 1	"	Collins Brick Co.	"	"	......
234	" 1	"	Grand Rapids Pottery	Flower pots and vases	"	......
235	" 7	"	Grand Rapids Leather Co.	Sole leather	run.	full
236	" 7	"	Mill Creek Mills	Flour and feed	"	"
237	" 8	"	C. F. Nason	Lumber	idle	......
238	" 8	"	Sherwood-Swortfiguer Co.	Ladies' straw hats	run.	full
239	" 8	"	Fuller & Rice Lumber & Mfg. Co	General wood work	"	"
240	" 9	"	Gunn Folding Bed Co.	Folding beds and desks.	"	"
241	" 9	"	Harrison Wagon Co.	Wagons and sleighs	"	part
242	" 9	"	Kent Furniture M'f'g. Co.	Furniture	"	full
243	" 9	"	G'd Rapids Carved Moulding Co.	Carved moulding	"	"
244	" 9	"	Palmer Laundry Co.	Laundry work	"	"
245	" 10	"	Jacob Mol	Sorted rags	"	"
246	" 10	"	Michigan Art Carving Co.	Furn. ornam'ts & mo'd's	"	"
247	" 10	"	Slooter Bros.	Brooms	"	"
248	" 10	"	Haldane Lumber Co.	Lumber	"	"
249	" 10	"	G'd Rapids School Furniture Co.	School furniture, etc.	"	"
250	" 11	"	Mueller & Slack Co.	Upholstered furniture	"	"

* This is a new factory not yet in active operation.

District No. 3. *L. C. F. Hintz, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	48	6	3	----	375	----	----	------	10	60	----	----	yes	yes	no	¶	----	----	----	yes	----	----	201
60	60	8	5	3	125	----	----	------	10	60	----	----	----	“	“	¶	yes	yes	----	“	yes	----	202
60	60	----	2	----	100	----	----	------	10	60	----	----	----	“	“	¶	----	----	----	“	----	----	203
60	--	5	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	204
60	60	6	4	2	140	----	----	------	10	60	yes	yes	yes	yes	no	¶	yes	yes	----	yes	yes	----	205
60	60	4	3	1	195	----	----	------	10	60	----	“	“	“	“	¶	“	“	----	“	“	----	206
60	60	9	5	----	250	----	----	------	10	60	----	----	“	“	“	¶	----	----	----	“	----	----	207
†	†	50	37	1	1,500	----	----	------	10	50	yes	yes	“	“	“	¶	yes	yes	----	“	yes	----	208
60	54	100	50	30	3,000	----	----	------	10	50	“	“	“	“	“	¶	“	“	yes	“	“	----	209
60	60	500	375	----	13,000	----	1	yes	10	50	“	“	“	“	“	¶	“	“	“	“	----	----	210
60	60	240	225	----	8,000	----	3	“	10	50	“	“	“	“	“	yes	“	“	“	“	----	----	211
60	60	300	250	----	5,000	----	2	“	10	50	“	no	“	“	“	“	“	“	“	“	----	----	212
60	60	125	60	----	1,712	----	----	------	10	50	“	“	“	“	“	¶	“	“	“	“	----	----	213
60	60	32	23	9	1,165	----	----	------	10	60	“	“	no	“	“	¶	“	“	----	“	yes	----	214
60	60	11	10	----	360	----	----	------	10	§30	----	----	yes	“	“	¶	“	“	no	“	----	----	215
60	--	40	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	216
60	60	55	12	----	8,400	----	----	------	10	60	----	----	yes	yes	no	¶	yes	yes	----	yes	----	----	217
60	54	50	6	----	600	----	----	------	10	60	----	----	no	“	“	¶	“	“	----	“	----	----	218
60	60	9	7	----	300	----	----	------	10	60	----	----	yes	“	“	¶	“	“	----	“	----	----	219
--	--	----	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	220
60	60	25	25	----	1,000	----	----	------	10	§25	----	----	yes	yes	no	¶	yes	yes	no	yes	----	1	221
60	--	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	222
60	60	50	23	----	600	----	1	no	10	50	yes	no	yes	yes	no	no	yes	yes	yes	yes	----	----	223
60	60	108	106	2	3,000	----	9	yes	10	50	“	yes	“	“	“	yes	“	“	“	“	yes	----	224
60	60	3	2	----	10	----	----	------	10	60	----	----	----	“	“	¶	----	----	----	“	----	----	225
60	48	7	2	----	100	----	----	------	10	50	----	----	yes	“	“	¶	yes	yes	----	“	----	----	226
60	60	3	3	----	200	----	----	------	10	60	----	----	----	“	“	¶	----	“	----	“	----	----	227
60	60	5	3	2	244	----	----	------	10	60	----	----	yes	“	“	¶	----	“	----	“	yes	----	228
60	60	56	6	16	‡500	----	----	------	10	60	yes	yes	“	“	“	¶	yes	“	----	“	“	----	229
60	60	10	10	----	250	----	----	------	10	50	----	----	“	“	“	¶	“	“	yes	“	----	----	230
60	60	20	20	----	780	----	----	------	10	50	----	----	“	“	“	¶	----	----	----	“	----	----	231
60	--	150	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	232
60	--	30	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	233
60	--	5	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	234
60	60	40	30	----	1,170	----	----	------	10	60	yes	no	yes	yes	no	¶	yes	yes	----	yes	----	----	235
60	60	3	3	----	156	----	----	------	10	60	----	----	“	“	“	¶	“	“	----	“	----	----	236
60	--	26	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	237
60	60	150	42	100	4,500	----	----	------	10	50	yes	----	yes	yes	no	yes	yes	yes	----	yes	yes	----	238
60	60	85	52	1	3,000	----	----	------	10	50	----	----	“	“	“	¶	“	“	yes	“	“	1	239
60	60	200	193	----	3,930	----	6	yes	10	50	yes	yes	“	“	“	¶	“	no	“	“	----	----	240
60	48	175	90	----	3,870	----	----	------	10	60	“	“	“	“	“	¶	“	“	“	“	----	----	241
60	60	250	160	----	6,000	----	1	yes	10	50	“	“	“	“	“	yes	“	yes	“	“	----	1	242
60	60	16	16	----	600	----	----	------	10	50	----	----	“	“	“	¶	“	“	no	“	----	----	243
60	60	20	7	13	525	----	----	------	10	60	----	----	----	“	“	¶	“	“	----	“	yes	----	244
60	60	6	4	2	120	----	----	------	10	60	----	----	----	“	“	¶	----	----	----	“	“	----	245
60	60	8	8	----	225	----	----	------	10	50	----	----	yes	“	“	¶	yes	yes	no	“	----	----	246
60	60	9	7	1	250	----	----	------	10	60	----	----	----	“	“	¶	----	----	----	“	yes	----	247
60	60	27	27	----	900	----	----	------	10	50	----	----	yes	“	“	¶	yes	yes	..	“	----	----	248
60	60	532	283	7	16,550	----	----	------	10	60	yes	yes	“	“	“	yes	“	“	yes	“	yes	----	249
60	60	12	5	----	300	----	----	------	10	50	----	no	“	“	“	¶	“	“	no	“	----	----	250

† 144 hours—running day and night.
‡ Estimated.
§ Permit given by inspector.
¶ None required.

Inspection book No. 6. **TABLE No. 3.—CONTINUED.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
251	Apr. 11	Grand Rapids	J. W. Fox Excelsior Co.	Excelsior	run.	full
252	" 11	"	W. P. Leffingwell & Son	Crates	"	"
253	" 11	"	B. W. Fish	Novelty turning	"	"
254	" 11	"	Baldwin, Tuthill & Bolton	Machinery	"	"
255	" 13	"	Grand Rapids Mattress Co.	Mattress springs, etc.	"	"
256	" 13	"	Widdicomb Furniture Co.	Furniture	"	part
257	" 13	"	Valley City Rattan Co.	Rattan goods	idle	......
258	" 13	"	Grand Rapids Brewing Co.	Bottled beer	run.	full
259	" 14	"	J. B. Folger & Sons	Carbonated drinks	"	"
260	" 14	"	Grand Rapids Book Case Co.	Furniture	"	"
261	" 14	"	Gissler & Fritz	Wagons and sleighs	"	"
262	" 14	"	Brechting Bros.	" " "	"	part
263	" 14	"	R. H. Haven	Wire goods	"	full
264	" 16	"	Bayne Com. Photo. Eng. Co.	Photos and engravings	"	"
265	" 16	"	Grand Rapids Veneer Works	Veneer and paneling	"	"
266	" 16	"	Haney School Furniture Co.	School furniture	"	"
267	" 16	"	Grand Rapids Panel Co.	Graining plates	"	"
268	" 16	"	C. O. & A. D. Porter	Machinery	"	part
269	" 17	"	Fox Machine Co.	Machinery and bicycles	"	full
270	" 17	"	Perkins & Co.	Machinery	"	part.
271	" 17	"	Souvenir Wheel Co.	Bicycles	"	full
272	" 17	"	Grand Rapids Glass Co.	Mirrors	"	"
273	" 17	"	Rempis & Gallmeyer	Brass and iron castings.	"	"
274	" 17	"	Valley City Top Factory	Buggy tops, etc.	"	"
275	" 20	"	Belknap Wagon and Sleigh Co.	Wagons and sleighs	"	"
276	" 20	"	John G. Lee	Printed matter	"	"
277	" 20	"	The Mascot	Newspaper	"	"
278	" 20	"	C. A. Wickstrom	Printed matter	"	"
279	" 20	"	Troy Laundry	Laundry work	"	"
280	" 20	"	Valley City Steel Wire Spring Co.	Springs	"	"
281	" 20	"	S. G. Stadon	Woolen rolls and yarn	"	"
282	" 21	"	Beack, Cook & Co.	Sorted beans	idle	......
283	" 21	"	Frank C. Hammerschmidt	Bread and pastry	run.	full
284	" 21	"	Peterson & Willebrand	Lager beer	"	"
285	" 21	"	Star Knitting Works	Ladies' underwear	"	"
286	" 21	"	Grand Rapids Dowell Works	General wood work	"	"
287	" 21	"	J. G. Alexander Mfg. Co.	Draughting tables	"	part
288	" 21	"	Western Chair Co.	Chairs	"	full
289	" 22	"	C. G. A. Voigt & Co.	Flour and feed	"	"
290	" 22	"	West Side Iron Works	Machinery and fire esc.	"	"
291	" 22	"	Hansen & Duns	Brass castings	"	"
292	" 22	"	McDonald & Carroll	Boilers, etc.	"	part
293	" 22	"	Edward Tannewitz	Special mach. & stamp.	"	"
294	" 23	"	J. R. Dennison & Co.	Patterns and models	"	full
295	" 23	"	Grand Rapids Handscrew Co.	Furn., showcases, etc.	"	part
296	" 23	"	Benedict Furniture Clamp Co.	Furniture clamps	"	full
297	" 23	"	Valley City Desk Co.	Desks	"	"
298	" 23	"	Peninsular Plating Co.	Electroplate goods	"	"
299	" 23	"	Peninsular Machine Co.	Bicycles	"	"
300	" 23	"	Valley City Carpet Clean Works	Carpet cleaning	"	"

District No. 3. *L. C. F. Hintz, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. h'rs males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	15	14	1	$350	----	----	------	10	50	yes	no	yes	yes	no	§	yes	yes	no	yes	yes	----	251
60	60	7	4	----	100	----	----	------	10	50	----	----	"	"	"	§	"	"	"	"	----	----	252
60	60	5	5	----	140	----	----	------	10	50	--	----	"	"	"	§	"	no	----	"	----	----	253
60	60	36	34	2	1,000	----	----	------	10	50	---	----	"	"	"	§	"	yes	----	"	yes	----	254
60	60	60	25	10	800	----	----	------	10	60	yes	yes	"	"	"	§	"	"	----	"	"	1	255
60	54	700	397	3	12,000	----	----	------	10	50	"	"	"	"	"	yes	"	"	yes	"	"	----	256
60	--	85	----	----	------	----	----	------	----	---	----	----	----	----	----	----	----	----	----	----	----	----	257
60	60	9	9	----	250	----	----	------	10	60	---	---	yes	yes	no	§	yes	yes	----	yes	----	----	258
60	60	9	7	----	350	----	----	------	10	60	yes	yes	"	"	"	§	"	"	----	"	----	----	259
60	60	40	12	----	1,500	----	----	------	10	50	"	no	"	"	"	yes	"	no	yes	"	----	----	260
60	60	12	8	----	300	----	----	------	10	50	"	yes	"	"	"	§	"	yes	"	"	----	----	261
60	54	9	6	----	350	----	----	------	10	60	----	no	"	"	"	§	"	"	----	"	----	----	262
60	60	3	2	----	100	----	----	------	10	60	----	----	----	"	"	§	----	---	----	"	----	----	263
57	57	20	10	1	600	----	----	------	10	60	---	----	yes	"	"	§	yes	yes	----	"	yes	-- -	264
60	60	195	171	2	5,500	----	----	------	10	50	yes	----	"	"	"	§	"	"	yes	"	"	----	265
60	60	160	119	6	2,500	----	----	------	10	50	----	----	"	"	"	§	"	"	"	"	"	----	266
60	60	8	8	----	125	----	----	------	10	60	----	----	"	"	"	§	"	"	----	"	----	----	267
60	54	23	13	----	640	----	----	------	10	60	yes	no	"	"	"	§	"	"	----	"	----	----	268
60	60	151	149	2	6,000	----	----	------	10	50	"	"	"	"	"	yes	"	"	yes	"	yes	----	269
60	48	130	50	----	2,000	----	----	------	10	50	"	yes	"	"	"	§	"	"	----	"	----	----	270
60	*	35	35	----	800	----	----	------	10	50	----	----	"	"	"	§	"	"	no	"	----	----	271
60	60	10	5	----	275	----	----	------	10	60	----	----	----	"	"	§	"	"	----	"	----	----	272
60	60	14	9	----	450	----	----	------	10	60	---	----	----	"	"	§	"	"	----	"	----	----	273
60	60	3	1	----	75	----	----	------	10	60	----	----	yes	"	"	§	----	----	----	"	----	----	274
60	60	52	40	----	1,200	----	----	------	10	50	yes	yes	"	"	"	yes	yes	yes	----	"	----	----	275
60	60	5	3	----	100	----	----	------	10	60	---	----	"	"	"	§	"	"	----	"	----	----	276
60	60	4	2	---	100	----	----	------	10	60	---	----	"	"	"	§	---	----	----	"	----	----	277
60	60	5	1	3	100	----	----	------	10	60	----	----	"	"	"	§	----	----	----	"	yes	----	278
60	60	9	2	3	150	----	----	------	10	60	----	----	"	"	"	§	yes	no	----	"	"	----	279
60	60	3	2	----	100	----	----	------	10	60	----	----	"	"	"	§	----	----	----	"	----	----	280
60	60	2	1	1	75	----	----	------	10	60	----	----	----	"	"	§	yes	yes	----	"	no	----	281
60	--	----	----	----	------	----	----	------	----	----	----	----	----	----	----	----	--	----	----	----	--	----	282
60	60	9	9	----	400	----	----	------	10	60	----	----	----	yes	no	§	---	---	----	yes	----	----	283
60	60	9	9	---	450	---	----	------	10	60	---	---	yes	"	"	§	yes	yes	----	"	--	----	284
60	60	54	8	46	1,400	----	----	------	10	50	yes	yes	"	"	"	§	"	"	--	"	yes	----	285
60	60	10	5	----	160	----	----	------	10	‡30	"	"	"	"	"	§	"	"	----	"	----	----	286
60	54	4	2	----	120	----	---	------	10	‡30	"	"	"	"	"	§	"	no	----	"	----	----	287
60	60	4	3	----	175	----	----	------	10	60	"	no	no	"	"	§	----	---	----	"	----	----	288
†	†	35	35	----	1,600	----	----	------	10	60	----	----	yes	"	"	yes	yes	yes	----	"	----	----	289
60	60	8	4	----	200	----	----	------	10	60	----	----	----	"	"	§	"	"	----	"	----	----	290
60	60	3	2	----	130	----	----	------	10	60	----	----	yes	"	"	§	"	"	----	"	----	----	291
60	48	9	8	----	125	----	----	------	10	60	----	----	----	"	"	§	"	"	----	"	----	----	292
60	54	10	8	1	400	----	----	------	10	60	----	----	----	"	"	§	"	"	----	"	no	----	293
60	60	4	2	---	100	----	----	------	10	60	----	----	yes	"	"	§	"	no	----	"	----	----	294
60	57	----	19	1	1,000	----	----	------	10	60	yes	yes	"	"	"	yes	"	yes	yes	"	yes	----	295
60	60	4	1	----	100	----	----	------	10	60	----	----	---	"	"	§	"	"	----	"	----	----	296
60	60	75	73	2	2,800	----	----	------	10	50	yes	no	yes	"	"	yes	"	"	yes	"	yes	----	297
60	60	8	8	----	290	----	----	------	10	60	----	----	"	"	"	§	"	"	"	"	----	----	298
60	60	20	17	----	800	----	----	------	10	60	yes	yes	"	"	"	§	"	"	----	"	----	----	299
60	60	8	3	1	200	----	----	------	10	60	"	"	"	"	"	§	"	"	----	"	no	----	300

* 72 hours-running overtime.
† 144 hours-running day and night.
‡ Permit given by inspector.
§ None required.

Inspection book No. 7. **TABLE No. 3.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
301	Apr.	27	Grand Rapids	Nelson & Stringle	Files	run.	full
302	"	27	"	Frank Edge & Co.	Saws	"	"
303	"	27	"	Powers & Casket Co.	Caskets	"	"
304	"	27	"	Grand Rapids Brush Co.	Brushes	"	"
305	"	27	"	H. B. Feather Co.	Mat., springs & couches	"	"
306	"	28	"	M. W. Owens	Photographs	"	"
307	"	28	"	Gd. Rapids Fancy Furniture Co.	Furniture	"	"
308	"	28	"	Crescent Roller Mills	Flour and feed	"	"
309	"	28	"	Hetterscheid Mfg. Co.	Patterns	"	"
310	"	28	"	Harring & Attwood	Brass goods	"	"
311	"	28	"	N. Y. Electroplating & Mfg. Co.	Electroplating, etc	"	"
312	"	29	"	Gd. Rps. Elct. Light & Power Co.	Electricity	"	"
313	"	29	"	Gd. Rapids Clock & Mantel Co.	Clock cases & mantels	"	"
314	"	29	"	Aldine Mfg. Co.	Grates	"	"
315	"	29	"	Grand Rapids Marble Co.	Monuments	"	"
316	"	29	"	Wolverine Spice Co.	Baking powder & spices	"	"
317	May	1	"	Grand Rapids Brass Co.	Brass goods	"	"
318	"	1	"	Model Mills	Flour and feed	"	"
319	"	1	"	Ocker & Ford Mfg. Co.	General woodwork	"	"
320	"	1	"	F. C. Miller	Lumber and boxes	"	part
321	"	1	"	Gd. Rps. Carpet Cleaning W'ks	Clean carpets	"	full
322	"	4	"	Gd. Rapids. Gypsum Marble Co	Marble	idle	......
323	"	4	"	Friction Set Works Co.	Saw mill machinery	run.	part
324	"	4	"	Phœnix Furniture Co.	Furniture	"	full
325	"	4	"	Diamond Wall Plaster Co.	Plaster	idle	......
326	"	4	"	H. A. Britt	Bottled beer	run.	full
327	"	4	"	Chas. Schmidt & Bros.	Monuments & cut stone	"	"
328	"	4	"	Chas. J. Worfel	Cigars	"	"
329	"	5	"	F. Hartman & Co.	Wagon scales & machin.	"	"
330	"	5	"	Henry J. Hartman	Castings	"	"
331	"	5	"	Grand Rapids Stave Co.	Staves, heading & bbls.	"	"
352	"	5	"	Stow & Davis Furniture Co.	Tables	"	"
333	"	5	"	Warren-Scharf Asphalt Co.	Paving asphalt	idle	......
334	"	5	"	Heys, Kirk & Muste	Cut stone	run.	full
335	"	6	"	Grand Rapids Cycle Co.	Bicycles	"	"
336	"	6	"	Gd. Rapids Wheelbarrow Co.	Wheel barrows	"	"
337	"	6	"	Gd. Rds. Mfg. & Implement Co.	Agriculture implements	"	"
338	"	6	"	Kiefer & Fecht Co.	Pulled wool	"	"
339	"	6	"	Wallin Leather Co.	Sole leather	"	"
340	"	7	"	W. T. Bently	Barrels	"	"
341	"	7	"	Wm. H. Pettit	Baby carriages & chairs	"	"
342	"	7	"	O. & W. Thum Co.	Fly paper	"	"
343	"	7	"	Ornamental Stamping Works	Ornamental metal w'ks	"	"
344	"	7	"	Grand Rapids Seating Co.	School furniture, etc.	"	"
345	"	8	"	Valley City Dowel Co.	Dowels and moldings	"	part
346	"	8	"	Ball Bros.	Ornamental glass	"	full
347	"	8	"	Grand Rapids Plaster Co.	Plaster and stucco	"	part
348	"	8	"	Diamond Wall Finish Co.	Wall finish	"	full
349	"	8	"	Grand Rapids Gypsum Co.	Plaster and stucco	idle	......
350	"	14	Grandville	Gypsum Plaster and Stucco Co.	" "	run.	full

District No. 3. *L. C. F. Hintz, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 24 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	5	4	----	$140	----	----	------	10	60	----	----	yes	yes	no	‡	yes	yes	----	yes	----	----	301
60	60	8	3	----	170	----	----	------	10	60	----	----	“	“	“	‡	“	“	----	“	----	----	302
60	60	60	46	8	1,600	----	----	------	10	50	yes	yes	“	“	“	yes	“	“	yes	“	yes	----	303
60	60	180	60	120	3,000	----	4	yes	10	50	“	“	“	“	“	“	“	“	“	“	“	----	304
60	60	16	14	2	700	----	----	------	10	50	“	“	“	“	“	“	“	no	----	“	“	----	305
60	60	8	2	1	200	----	----	------	10	60	----	----	“	“	“	‡	----	----	----	“	“	----	306
60	60	60	30	----	1,500	----	----	------	10	50	yes	no	“	“	“	no	yes	yes	yes	“	----	----	307
*	*	31	30	1	1,600	----	----	------	10	50	“	----	“	“	“	yes	“	“	----	“	yes	----	308
60	60	4	1	----	100	----	----	------	10	60	----	----	“	“	“	‡	“	“	----	“	----	----	309
60	60	17	13	1	500	----	----	------	10	50	yes	no	“	“	“	yes	“	“	no	“	no	----	310
60	60	6	6	----	250	----	----	------	10	50	“	“	----	“	“	‡	“	“	“	“	----	----	311
*	*	25	25	----	1,375	----	----	------	10	60	----	----	yes	“	“	‡	“	“	----	“	----	----	312
60	60	30	20	----	800	----	1	yes	10	50	----	----	“	“	“	‡	“	“	----	“	----	----	313
60	60	40	20	3	1,200	----	----	------	10	50	----	----	----	“	“	‡	“	“	yes	“	yes	----	314
60	60	5	2	----	100	----	----	------	10	60	----	----	----	“	“	‡	----	----	----	“	----	----	315
60	60	5	5	----	200	----	----	------	10	60	----	----	yes	“	“	‡	yes	yes	----	“	----	----	316
60	60	300	124	32	6,000	----	----	------	10	50	yes	yes	“	“	“	‡	“	“	yes	“	yes	----	317
*	*	20	20	----	†	----	----	------	10	60	----	----	no	“	“	‡	“	“	----	“	----	----	318
60	60	47	46	1	2,100	----	----	------	10	50	yes	yes	yes	“	“	‡	“	no	yes	“	yes	----	319
60	42	30	30	----	900	----	----	------	10	60	----	----	“	“	“	‡	“	yes	“	“	----	----	320
60	60	4	4	----	200	----	----	------	10	60	----	----	----	“	“	‡	“	“	----	“	----	----	321
60	--	6	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	322
60	48	15	3	----	156	----	----	------	10	60	----	----	no	yes	no	‡	yes	yes	----	yes	----	----	323
60	60	550	294	6	9,000	----	----	------	10	50	yes	no	yes	“	“	yes	“	“	yes	“	yes	----	324
60	--	8	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	325
60	60	12	9	----	400	----	----	------	10	60	----	----	----	yes	no	‡	yes	yes	----	yes	----	----	326
60	60	12	8	----	400	----	----	------	10	60	----	----	----	“	“	‡	“	“	----	“	----	----	327
48	48	5	3	1	160	----	----	------	8	60	----	----	yes	“	“	‡	----	----	----	“	yes	----	328
60	60	12	4	----	180	----	----	------	10	50	----	----	“	“	“	‡	yes	yes	yes	“	----	----	329
60	60	40	18	----	675	----	----	------	10	50	----	----	----	“	“	‡	“	“	“	“	----	----	330
60	60	110	75	----	3,000	1	----	------	10	50	yes	yes	yes	“	“	yes	“	“	“	“	----	----	331
60	60	76	52	1	1,400	----	----	------	10	50	“	“	“	“	“	“	“	no	“	“	yes	----	332
60	--	40	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	333
54	54	20	2	----	200	----	----	------	9	60	----	----	----	yes	no	‡	yes	yes	----	yes	----	----	334
60	60	285	280	5	12,400	----	----	------	10	50	yes	yes	yes	“	“	‡	“	“	yes	“	yes	----	335
60	60	30	18	----	750	----	----	------	10	50	“	“	no	“	“	‡	“	“	“	“	----	----	336
60	60	40	30	----	900	----	----	------	10	50	“	“	yes	“	“	yes	“	“	“	“	----	----	337
60	60	13	13	----	400	----	----	------	10	50	----	----	“	“	“	‡	“	“	----	“	----	----	338
60	60	37	37	----	1,325	----	----	------	10	50	----	----	“	“	“	‡	“	“	----	“	----	----	339
60	60	25	17	----	500	----	----	------	10	60	----	----	----	“	“	‡	----	----	----	“	----	----	340
60	60	25	6	4	200	----	----	------	10	50	----	----	yes	“	“	‡	yes	yes	----	“	yes	----	341
60	60	150	41	31	2,000	----	2	yes	10	50	yes	yes	“	“	“	‡	“	no	----	“	“	--	342
60	60	8	5	----	125	----	----	------	10	50	----	----	----	“	“	‡	“	yes	----	“	----	----	343
60	60	135	78	2	2,500	----	3	yes	10	50	----	----	yes	“	“	‡	“	“	yes	“	yes	----	344
60	48	5	3	----	130	----	----	------	10	60	----	----	“	“	“	‡	“	no	----	“	----	----	345
60	60	10	1	----	75	----	----	------	10	60	----	----	----	“	“	‡	----	----	----	“	----	----	346
60	48	40	28	----	750	----	----	------	10	50	----	----	yes	“	“	‡	yes	yes	----	“	----	----	347
60	60	13	8	3	500	----	----	------	10	60	----	----	----	“	“	‡	“	“	----	“	yes	----	348
60	--	35	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	349
60	60	55	40	----	800	----	----	------	10	50	----	----	yes	yes	no	‡	yes	yes	----	yes	----	----	350

*144 hours-running night and day. †Included in pay roll of Valley City Milling Co. ‡None required.

Inspection book No. 8. **TABLE No. 8.—Continued.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or so'd?	Running or idle?	If running, is it full or part time?
351	May 14	Grandville	Loren Day Estate	Plaster and stucco	idle	......
352	" 14	Jenison	Jenison Mills	Flour and feed	run.	full
353	" 14	"	Jenison Saw Mill	Lumber and shingles	"	"
354	" 14	"	Jenison Manufacturing Co.	Railroad supplies	idle	......
355	" 15	Zeeland	C. DeYoung & Bro.	General woodwork	run.	full
356	" 15	"	Little Wonder Mills	Flour and feed	"	"
357	" 15	"	Unity Roller Mills	" " "	"	part
358	" 15	"	Zeeland Furniture Co.	Furniture	"	full
359	" 15	"	Zeeland Brick Co.	Brick	"	"
360	" 18	Holland	Holland Carriage & Bend. Wk's	Bent woodwork	idle	......
361	" 18	"	C. L. King & Co.	Baskets & butter plates	run.	full
362	" 18	"	West Michigan Seating Co.	School furn. and opera chairs.	idle	......
363	" 18	"	West Michigan Furniture Co.	Furniture	run.	full
364	" 18	"	Cappon & Bertsch Leather Co.	Harness & upper leather	"	"
365	" 18	"	T. Slagh & Co.	General woodwork	"	part
366	" 18	"	Holland City Steam Laundry	Laundry work	"	full
367	" 19	"	Geo. Schoenith	Lager beer	"	"
368	" 19	"	Buss Machine Co.	Machinery	"	"
369	" 19	"	James Huntley	General woodwork	idle	......
370	" 19	"	Phœnix Planing Mill	" "	run.	full
371	" 19	"	De Grondwet	Newspaper	"	"
372	" 19	"	James Schoon & Son	Sole leather	"	"
373	" 19	"	Alfred Huntley	Machinery	"	"
374	" 19	"	Holland Furniture Co.	Furniture	"	"
375	" 20	"	Walsh-DeRoo Milling Co.	Flour and feed	"	part
376	" 20	"	Ottawa Furniture Co.	Furniture	"	full
377	" 20	"	West Michigan Steam Laundry	Laundry work	"	"
378	" 20	"	Lake Side Furniture Co.	Screens	"	"
379	" 20	"	A. Van Putten & Co.	Tubs and pails	"	"
380	" 20	"	Cappon & Bertsch Leather Co. (North Side).	Sole leather	"	"
381	" 21	"	Holland City News	Printed matter	"	"
382	" 21	"	H. Van Tongeren	Cigars	"	"
383	" 21	"	City Mills	Flour and feed	"	"
384	" 21	"	J R. Kleyn Estate	General woodwork	"	"
385	" 21	"	City Water Wk. & Elec. Light Sta.	Electricity	"	"
386	" 21	Grand Haven	Grand Haven Leather Co.	Sole leather	"	"
387	" 21	"	Ruby Match Co.	Matches	"	"
388	" 22	"	Challenge Corn Planter Co.	Corn planters & refrig's	"	"
389	" 22	"	Dake Engine Manufacturing Co.	Engines and machinery	"	"
390	" 22	"	Archie Campbell	Castings	"	"
391	" 22	"	Sterling Furniture Co.	Furniture	"	part
392	" 22	"	Silas Kilbourn & Co.	Tubs, pails and kegs	"	full
393	" 22	"	American Mirror & Glass Bev. Co.	Mirrors	"	"
394	" 22	"	Grand Haven Electric Light Co.	Electricity	"	"
395	" 22	"	Grand Haven Courier Journal	Printed matter	"	"
396	" 23	"	White Laundry	Laundry work	"	"
397	" 23	"	Grand Haven Steam Laundry	" "	"	"
398	" 23	"	Grand Haven News	Printed matter	"	"
399	" 23	Ferrysburg	Johnston Bros.	Boilers, etc.	"	"
400	" 23	Spring Lake.	Clinker Boat Manufacturing Co.	Boats	"	"

District No. 3. *L. C. F. Hintz, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	..	33	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	351
60	60	5	5	----	$270	--	----	------	10	60	----	----	no	yes	no	¶	yes	no	----	yes	----	----	352
60	60	25	10	----	400	----	----	------	10	60	----	----	"	"	"	¶	"	"	----	"	----	----	353
60	..	30	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	354
60	60	8	8	----	156	----	----	------	10	60	----	----	----	yes	no	¶	yes	yes	----	yes	----	----	355
72	72	6	6	----	200	----	----	------	10	60	----	----	yes	"	"	¶	"	"	----	"	----	----	356
60	48	7	7	----	180	----	----	------	10	60	----	----	"	"	"	¶	"	no	----	"	----	----	357
60	60	70	70	----	1,500	----	1	yes	10	50	yes	yes	"	"	"	¶	"	yes	yes	"	----	1	358
60	60	60	25	----	1,800	----	----	------	10	50	----	----	"	"	"	¶	"	"	----	"	----	----	359
60	--	35	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	360
60	60	250	136	47	3,500	----	10	yes	10	50	yes	yes	yes	yes	no	yes	yes	no	yes	yes	yes	----	361
60	--	50	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	362
60	60	365	347	3	10,800	----	8	no	10	50	yes	yes	yes	yes	no	¶	yes	yes	yes	yes	yes	----	363
60	60	265	190	----	7,500	----	----	------	10	60	"	"	"	"	"	yes	"	"	----	"	----	1	364
60	54	20	8	----	400	----	----	------	10	60	"	----	no	"	"	¶	"	no	----	"	----	----	365
60	60	6	3	3	250	----	----	------	10	60	----	----	----	"	"	¶	"	yes	----	"	no	----	366
60	60	5	4	----	150	----	----	------	10	60	----	----	yes	"	"	¶	"	"	----	"	----	----	367
60	*	12	9	----	450	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	----	----	368
60	..	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	369
60	60	20	14	----	400	----	----	------	10	60	----	----	yes	yes	no	¶	yes	no	---	yes	----	----	370
60	60	10	10	----	400	----	----	------	10	60	yes	----	"	"	"	¶	"	yes	----	"	----	----	371
60	60	4	4	----	110	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	----	----	372
60	60	5	5	----	260	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	----	----	373
60	60	156	135	----	3,500	----	1	yes	10	50	yes	yes	yes	"	"	¶	"	"	yes	"	----	----	374
†	72	34	34	...	1,836	----	----	------	10	60	"	----	"	"	"	yes	"	"	----	"	----	----	375
60	60	125	93	1	3,000	----	4	yes	10	50	"	yes	"	"	"	"	"	"	yes	"	----	----	376
60	60	8	2	6	175	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	no	----	377
60	60	15	15	----	425	----	----	------	10	50	yes	no	yes	"	"	¶	"	"	no	"	----	----	378
54	54	65	60	----	1,500	----	9	yes	9	60	----	----	----	"	"	¶	"	"	yes	"	----	----	379
60	60	52	48	----	1,675	----	1	"	10	45	yes	no	yes	"	"	yes	"	"	----	"	----	1	380
60	60	10	10	----	800	----	----	------	10	60	----	----	"	"	"	¶	"	"	----	"	----	---	381
54	54	8	3	5	208	----	----	------	9	60	----	----	----	"	"	¶	----	----	---	"	yes	----	382
60	60	5	5	----	200	----	----	------	10	60	----	---	yes	"	"	¶	yes	yes	----	"	----	----	383
60	54	35	9	----	340	----	1	yes	10	60	yes	yes	"	"	"	¶	"	no	----	"	----	----	384
‡	‡	5	5	----	245	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	----	----	385
60	60	52	45	----	1,550	----	----	------	10	60	yes	yes	yes	"	"	yes	"	yes	----	"	----	----	386
60	60	50	22	28	875	1	14	no	10	60	----	----	no	"	"	¶	"	no	----	"	yes	----	387
60	60	200	200	----	6,000	----	----	------	10	50	yes	yes	yes	"	"	¶	"	yes	yes	"	----	----	388
60	60	14	14	----	600	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	----	----	389
60	60	6	4	----	200	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	----	----	390
60	48	55	42	----	1,600	----	1	yes	10	60	yes	yes	yes	"	"	¶	"	no	yes	"	----	----	391
60	60	125	91	----	2,400	----	3	"	10	50	----	----	"	"	"	¶	"	yes	no	"	----	1	392
60	60	60	50	----	1,700	----	1	"	10	50	----	----	----	"	"	¶	"	"	----	"	----	----	393
§	§	4	4	----	145	----	----	------	10	60	----	----	yes	"	"	¶	"	"	----	"	----	----	394
60	60	7	4	3	150	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	yes	----	395
60	60	10	1	5	125	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	no	----	396
60	60	11	3	4	185	----	----	------	10	60	----	----	no	"	"	¶	"	no	----	"	"	----	397
60	60	8	2	3	115	----	----	------	10	60	----	----	----	"	"	¶	"	yes	----	"	"	----	398
60	60	70	30	----	1,400	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	----	----	399
60	60	10	6	----	165	----	1	yes	10	60	----	----	yes	"	"	¶	----	----	----	"	----	----	400

* 72 hours-running overtime.
† 144 hours-day and night while running.
‡ 144 hours-running day and night.
§ Run when light is needed.

¶ None required.

Inspection book No. 9. **TABLE No. 8.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
401	May	28	Spring Lake.	Spring Lake Basket Co.	Fruit packages	run.	full
402	"	28	Fruitport	Spring Lake Iron Co.	Pig iron	"	"
403	"	27	Muskegon	Chase Bros. Piano Co.	Pianos	"	"
404	"	27	"	J. Loescher Tannery Co.	Leather	"	"
405	"	27	"	Lakeside Manufacturing Co.	Lumber	idle	......
406	"	27	"	J. E. Strong	Shingles	run.	full
407	"	27	"	McGraft Lumber Co.	Lumber	idle	......
408	"	27	"	McGraft Lumber Co.	Dres'd lumb'r & shingl's	run.	full
409	"	27	"	Crescent Manufacturing Co.	Nail keg stock	"	"
410	"	27	"	F. B. Pillsbury	Kindling wood	idle	......
411	"	28	"	Hovey & McCracken	Lumber and lath	run.	full
412	"	28	"	W. G. Watson & Co.	Dressed lumber, etc.	"	part
413	"	28	"	Muskegon Brewing Co.	Lager beer	"	full
414	"	28	"	Muskegon Bottling Works	Carbonated drinks	"	"
415	"	28	"	Muskegon Railway Co.	Electricity & car repairs	"	"
416	"	28	"	Stewart Hartshorn Co.	Curtain rollers	"	part
417	"	28	"	U. S. Baking Co., Muskegon br'ch	Crackers and cakes	"	full
418	"	29	"	The P. Hayden Saddlery Hdw. Co.	Hame woods	"	"
419	"	29	"	Lakeside Iron Co.	Machinery	"	part
420	"	29	"	Muskegon Boiler Works Co.	Boilers, etc.	"	full
421	"	29	"	Barcus Bros.	Saws	idle	......
422	"	29	"	Davies Iron Works	Trucks	"	......
423	"	29	"	Thayer Lumber Co., No. 2	Lumber and lath	run.	full
424	"	29	"	Thayer Lumber Co.	" "	"	"
425	June	2	"	F. W. Averill	Cigars	"	"
426	"	2	"	Amazon Hosiery Co.	Hos'y, gloves, mit'ns, etc	"	"
427	"	2	"	Watson & Fink	Cigars	"	"
428	"	2	"	Muskegon Steam Laundry	Laundry work	"	"
429	"	2	"	Rodgers Iron Works	Saw mill machinery	"	part
430	"	2	"	Muskegon Gas Light Co.	Gas and coke	"	full
431	"	2	"	Muskegon Saw Works	Saws	"	"
432	"	3	"	Peoples' Steam Laundry	Laundry work	"	"
433	"	3	"	John Rohrig	Baked goods	"	"
434	"	3	"	Scott & Vanderlaan	Cigars	"	"
435	"	3	"	Muskegon Chronicle	Printed matter & bind'g	"	"
436	"	3	"	The Morning News	Printed matter	"	"
437	"	3	"	Francis Jiroch	Cigars	"	"
438	"	3	"	W. W. Andrews	Printed matter	"	"
439	"	3	"	Muskegon Book Bindery	Blank books and binding	"	"
440	"	4	"	E. H. Stafford Co.	Ch., school & office furn.	"	"
441	"	4	"	Muskegon Electric Light Co.	Electricity	"	"
442	"	4	"	W. R. Jones	Lumber	"	"
443	"	4	"	Neal & Alwin	Flour and feed	"	"
444	"	4	"	Muskegon Milling Co.	" "	"	part
445	"	4	"	J. A. Cowan	Cigars	"	full
446	"	4	"	J. Torrent & Co.	Lumber	idle	......
447	"	5	"	Veva & Bloodgood	Kindling wood	"	......
448	"	5	"	D. A. Miner	Shingles	"	......
449	"	5	"	C. & W. M. R. R. Shops	Locomotive & car repa's	run.	part
450	"	5	"	S. S. Watson & Co.	Excelsior	"	full

District No. 3. *L. C. F. Hintz, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the ages of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	130	92	10	$2,750	----	3	no	10	60	yes	no	yes	yes	no	**	yes	no	----	yes	yes	1	401
*	*	50	50	----	2,000	----	----	----	10	‖	"	yes	no	"	"	**	"	yes	----	"	----	----	402
60	60	200	74	1	2,800	----	----	----	10	50	"	"	yes	"	"	yes	"	"	yes	"	yes	----	403
60	60	100	30	1	1,000	----	----	----	10	50	"	no	"	"	"	**	"	"	"	"	"	----	404
60	--	100	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	405
60	60	50	38	----	1,450	----	----	----	10	50	----	----	yes	yes	no	**	yes	yes	yes	yes	----	----	406
60	..	60	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	407
60	60	40	23	----	725	----	----	----	10	50	----	----	yes	yes	no	**	yes	yes	yes	yes	----	----	408
60	60	71	70	1	2,000	----	---	----	10	50	----	----	----	"	"	**	"	"	----	"	yes	1	409
60	..	9	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	410
60	60	95	95	----	2,005	----	----	----	10	50	----	---	yes	yes	no	**	yes	yes	----	yes	----	----	411
60	48	100	50	1	1,700	----	----	----	10	60	----	----	----	"	"	**	"	"	yes	"	no	----	412
60	60	22	22	----	1,200	----	----	----	10	60	----	-	yes	"	"	yes	"	"	----	"	----	----	413
60	60	5	3	----	120	----	----	----	10	60	yes	yes	"	"	"	**	--	----	----	"	----	----	414
60	60	12	9	----	400	----	----	----	10	60	----	----	"	"	"	**	yes	yes	----	"	----	----	415
60	45	300	199	1	4,500	----	17	¶	10	50	yes	yes	"	"	"	yes	"	"	yes	"	yes	----	416
60	60	33	15	18	800	----	----	----	10	60	"	"	"	"	"	**	"	"	----	"	"	----	417
60	60	27	27	----	900	----	2	yes	10	50	----	----	"	"	"	**	"	"	yes	"	----	----	418
60	48	26	8	----	350	----	----	----	10	50	----	----	"	"	"	**	"	"	----	no	----	----	419
60	60	35	15	----	650	----	1	yes	10	50	----	----	----	"	"	**	"	"	----	"	----	----	420
60	..	9	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	421
60	..	10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	422
60	60	106	106	----	‡	----	----	----	10	50	----	----	yes	yes	no	**	yes	yes	----	yes	-- -	----	423
60	60	107	106	1	§	----	----	----	10	50	----	----	"	"	"	**	"	"	----	"	yes	1	424
48	48	6	4	----	150	----	1	no	8	60	----	----	----	"	"	**	----	----	----	"	----	----	425
60	60	500	91	195	5,000	----	28	"	10	60	yes	no	yes	"	"	yes	no	no	----	"	yes	1	426
48	48	10	7	----	350	----	----	----	8	60	----	----	----	"	"	**	----	----	----	"	----	----	427
60	60	17	4	8	300	----	----	----	10	60	----	----	----	"	"	**	yes	yes	----	"	yes	----	428
60	48	100	25	----	1,200	----	----	----	10	60	----	----	yes	"	"	**	"	"	----	no	----	----	429
*	*	5	5	----	270	----	----	----	10	60	----	----	"	"	"	**	"	"	----	yes	- --	----	430
60	60	5	2	----	100	----	----	----	10	60	----	----	----	"	"	**	"	"	----	"	----	----	431
60	60	24	4	14	300	----	----	----	10	60	----	----	----	"	"	**	"	"	----	"	yes	----	432
60	60	6	5	1	225	----	----	----	10	60	----	----	yes	"	"	**	----	---	----	"	"	----	433
48	48	9	7	----	200	----	----	----	8	60	----	----	----	"	"	**	----	----	----	"	----	----	434
60	60	23	18	5	900	----	----	----	10	60	----	----	----	"	"	**	yes	yes	----	"	yes	----	435
60	60	10	9	1	400	----	----	----	10	60	----	----	yes	"	"	**	"	"	----	"	"	----	436
48	48	16	13	1	400	----	----	----	8	60	----	----	----	"	"	**	----	----	----	"	"	----	437
60	60	5	2	----	75	----	----	----	10	60	----	----	----	"	"	**	yes	yes	----	"	----	----	438
60	60	5	3	----	125	----	----	----	10	60	----	----	yes	"	"	**	"	"	----	"	----	----	439
60	60	130	118	2	3,250	----	2	yes	10	50	yes	yes	no	"	"	no	"	"	no	"	yes	----	440
*	*	12	12	----	630	----	----	----	10	60	----	----	yes	"	"	**	"	"	----	"	----	----	441
60	60	26	26	----	885	----	----	----	10	60	----	----	"	"	"	**	"	"	----	"	----	----	442
60	60	3	2	----	75	----	----	----	10	60	-- -	----	"	"	"	**	"	"	----	"	----	----	443
†	60	26	19	1	625	----	----	----	10	60	----	----	"	"	"	**	"	"	----	"	yes	----	444
48	48	5	3	----	200	----	----	----	8	60	----	----	----	"	"	**	----	----	----	no	----	----	445
60	..	65	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	446
60	..	6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	447
60	..	45	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	448
60	51	184	184	----	7,200	----	----	----	10	60	----	----	yes	yes	no	**	yes	yes	----	yes	----	1	449
60	60	7	7	----	180	----	----	----	10	60	----	----	----	"	"	**	"	no	----	"	----	----	450

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* 144 hours-running day and night.
† 144 hours-day and night, while running.
‡ Included in pay roll of No. 424.
§ $11,000-pay roll for both mills.

¶ Not all.
** None required.
‖ No stated time allowed, as they eat between heats and are allowed a short dinner hour.

Inspection book No. 10. **TABLE No. 3.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
451	June	5	Muskegon	The Utility Co.	Wood novelties	run.	full
452	"	5	"	Frank Cheeseman	General woodwork	"	"
453	"	5	"	Langeland Mfg. Co.	" "	"	"
454	"	5	"	Palmer Bros.	" "	"	"
455	"	8	"	Munroe Mfg. Co.	Dress. lum. & box shooks	"	"
456	"	8	"	Sargent Mfg. Co.	Hospital supplies, etc.	"	"
457	"	8	"	Wm. Heap	Closet seats and tanks	"	"
458	"	8	"	McCracken & Hovey Car. Co.	Freight cars	idle	......
459	"	8	"	Muskegon Valley Furniture Co.	Furniture	run.	full
460	"	9	"	Muskegon Chemical Engine Co.	Chemical engines	"	"
461	"	9	"	W. F. Wiselogel	General woodwork	"	part
462	"	9	"	Mich. Curled Hair Works	Curled hair & fertilizers	"	full
463	"	9	Mus. Heights	Gray Bros Mfg. Co.	Folding bath tubs	"	"
464	"	9	"	Electric Alarm Co.	Elect. special. & bicycles	"	"
465	"	9	"	Enterprise Brass Works	Brass castings	"	"
466	"	9	"	Standard Malleable Iron Co.	Malleable castings	"	"
467	"	9	"	Enterprise Foundry Co.	Gray iron castings	"	"
468	"	10	"	Shaw Electric Crane Co.	Electric cranes	"	"
469	"	10	"	Alaska Refrigerator Co.	Refrigerators	"	"
470	"	10	"	Mich. Washing Machine Co.	Washing machines	idle	......
471	"	10	"	Kelly Bros. Mfg. Co.	Bank & office furniture	run.	full
472	"	10	"	Morton Mfg. Co.	Special machinery	"	"
473	"	10	N. Muskegon	Gow & Campbell	Lumber	idle	......
474	"	10	"	Standard Box Shook Co.	Box shooks	"	......
475	"	10	"	F. Alberts & Co.	Lumber	run.	full
476	"	11	Whitehall	Eagle Tanning Co.	Leather	"	"
477	"	11	"	C. E. & M. B. Covell	Lumber and lath	"	"
478	"	11	"	Nufer Cedar Co.	Box shooks	"	"
479	"	11	"	C. E. & M. B. Covell	Shingles	"	"
480	"	11	"	Olsen & Youngquist	Flour, feed and lumber	"	"
481	"	11	"	Erichson, Steffee & Co.	General woodwork	"	"
482	"	11	"	E. M. Ruggles	Brick	"	"
483	"	11	"	Staples & Covell	Lumber	"	"
484	"	12	Montague	Montague Iron Works	Boilers and engines	"	"
485	"	12	"	Montague Roller Mills	Flour and feed	"	"
486	"	12	Shelby	Shelby Basket Co.	Fruit packages	"	"
487	"	12	"	Alexander Paton	Lumber	idle	......
488	"	12	"	J. A. Harrison	General wood. & handles	run.	full
489	"	12	Hart	Sandusky Mfg. Co.	Lumber and dim'n stock	"	"
490	"	12	"	Hart Cedar Lumber Co.	Lumber and shingles	"	"
491	"	13	Pentwater	Pentwater Bedstead Co.	Furniture	"	part
492	"	13	"	Sands & Maxwell	Lumber and shingles	"	full
493	"	13	"	C. H. Chapman	Shingles	"	"
494	"	13	"	Peter Labonta	General woodwork	"	"
495	"	13	"	J. Halstead	Tables	"	"
496	"	17	Fremont	Darling Milling Co.	Flour and feed	"	"
497	"	17	"	D. Gerber's Sons	Sole leather	"	"
498	"	17	"	K. Mulder	Lumber	"	"
499	"	17	"	Burns & Son	General woodwork	"	"
500	"	17	"	Fremont Mfg. Co.	Furniture	idle	......

District No. 3. ***L. C. F. Hintz, Deputy Inspector.***

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	10	4	....	$125	....	....	......	10	60	....	....	....	yes	no	‡	yes	yes	....	yes	....	....	451
60	60	12	2	....	100	....	....	......	10	60	....	....	..	"	"	‡	"	"	....	"	....	....	452
60	60	60	55	....	1,250	....	2	yes	10	60	....	....	yes	"	"	yes	no	no	yes	"	...	....	453
60	60	12	6	....	200	....	....	......	10	60	....	....	"	"	"	‡	yes	yes	....	"	....	....	454
60	60	150	125	....	2,500	....	5	yes	10	60	....	....	....	"	"	‡	"	no	yes	"	....	....	455
60	60	96	33	....	1,000	....	4	"	10	†30	yes	yes	yes	"	"	‡	"	yes	"	"	....	....	456
60	60	15	9	....	200	....	....	......	10	60	....	....	"	"	"	‡	....	....	....	"	....	....	457
60	..	300	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	458
60	60	175	124	1	3,300	....	....	......	10	60	yes	yes	no	yes	no	‡	yes	yes	yes	yes	yes	....	459
60	60	50	30	....	1,100	....	....	......	10	60	"	....	yes	"	"	‡	"	"	....	"	....	....	460
60	54	42	15	....	550	....	....	......	10	60	....	....	"	"	"	‡	"	"	yes	"	....	....	461
60	60	5	3	....	156	....	....	......	10	60	....	....	no	"	"	‡	"	"	....	"	....	....	462
60	60	25	24	....	700	....	....	......	10	50	yes	yes	yes	"	"	‡	"	no	yes	"	....	....	463
60	60	11	11	....	600	....	....	......	10	60	....	....	"	"	"	‡	"	yes	....	"	....	....	464
60	60	5	4	....	235	....	....	......	10	50	....	....	"	"	"	‡	"	"	....	"	....	....	465
60	60	150	73	1	3,135	....	....	......	10	60	yes	yes	"	"	"	‡	"	"	....	"	yes	2	466
60	60	25	19	....	600	....	....	......	10	60	....	....	no	"	"	‡	"	"	....	"	....	1	467
60	60	100	90	....	4,400	....	....	......	10	45	yes	yes	yes	"	"	‡	"	"	....	"	....	1	468
60	60	340	260	....	6,600	....	....	......	10	50	"	"	"	"	"	yes	"	"	yes	"	....	....	469
60	..	30	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	470
60	60	150	60	....	3,100	....	3	yes	10	†30	yes	yes	yes	yes	no	‡	yes	yes	yes	yes	....	1	471
60	60	25	25	....	900	....	....	......	10	60	"	"	"	"	"	‡	"	"	....	"	....	....	472
60	..	41	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	473
60	..	30	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	474
60	60	60	53	....	1,950	....	....	......	10	60	....	....	yes	yes	no	‡	yes	yes	....	yes	....	....	475
60	60	75	75	....	2,500	....	....	......	10	50	yes	no	"	"	"	yes	"	no	....	"	....	....	476
60	60	50	45	....	1,600	....	....	......	10	60	....	....	"	"	"	‡	"	yes	....	"	....	....	477
60	60	45	45	....	700	....	1	no	10	60	....	....	"	"	"	‡	"	no	....	"	....	....	478
60	60	27	27	....	1,000	....	....	......	10	60	....	....	"	"	"	‡	"	yes	yes	"	....	....	479
60	60	12	4	....	300	....	....	......	10	60	....	....	"	"	"	‡	"	"	....	"	....	....	480
60	60	20	12	....	450	....	....	......	10	50	....	....	"	"	"	‡	no	no	yes	"	....	....	481
60	60	25	16	....	470	....	....	......	10	60	....	....	....	....	....	‡	yes	yes	....	"	....	....	482
60	60	70	70	....	2,400	....	....	......	10	60	....	....	yes	yes	no	‡	"	no	....	"	....	....	483
60	60	52	23	....	1,200	....	....	......	10	60	....	...	no	"	"	‡	"	yes	....	"	....	....	484
60	60	5	4	1	130	....	....	......	10	60	....	....	yes	"	"	‡	"	no	....	"	no	....	485
60	60	30	18	2	*	....	2	no	10	60	....	....	....	"	"	‡	no	"	....	"	yes	1	486
60	..	16	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	487
60	60	15	2	....	100	....	....	......	10	60	....	...	yes	yes	no	‡	yes	no	yes	yes	....	....	488
60	60	25	8	....	500	....	....	......	10	60	....	....	no	"	"	‡	"	"	....	"	yes	....	489
60	60	11	11	....	250	....	....	......	10	60	....	...	"	"	"	‡	"	yes	....	"	....	....	490
60	48	170	150	....	4,100	....	7	yes	10	60	yes	no	yes	"		yes	"	"	yes	"	....	1	491
60	60	40	40	....	1,670	....	....	......	10	60	....	....	"	"	"	‡	"	"	"	"	....	....	492
60	60	30	30	....	1,100	....	....	......	10	60	....	....	"	"	"	‡	"	"	....	"	....	....	493
60	60	12	3	....	100	....	....	......	10	60	....	....	...	"	"	‡	"	"	....	"	....	....	494
60	60	30	10	....	400	....	....	......	10	60	....	....	yes	"	"	‡	"	"	....	"	....	....	495
60	60	6	4	....	180	....	....	......	10	60	....	....	"	"	"	‡	"	no	....	"	....	....	496
60	60	40	40	....	1,400	....	....	......	10	60	....	....	"	"	"	‡	"	yes	....	"	....	....	497
60	60	22	22	....	500	....	....	......	10	60	....	....	"	"	"	‡	"	"	....	"	....	....	498
60	60	15	4	....	250	....	....	......	10	60	....	....	"	"	"	‡	no	no	....	"	....	....	499
60	..	50	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	500

*** Cannot tell, as they have just started. † Permit given by inspectors. ‡ None required.**

Inspection book No. 11. **TABLE No. 8.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
501	June 18	White Cloud.	James Cycle Manufacturing Co.	Bicycles	run.	full
502	" 18	Keno	Richard Oxford	Lumber	idle	......
503	" 18	"	Horning & Hart	"	run.	full
504	" 18	"	E. T. Lockerby	Lumber and shingles	"	"
505	" 18	Sisson	Sisson & Lilley Lumber Co.	Lumber and lath	"	"
506	" 18	"	Sisson & Lilley Lumber Co.	Shingles	"	"
507	" 18	"	Sisson & Lilley Lumber Co.	Dressed lumber	"	"
508	" 18	Otia	Geo. Buell	Lumber and shingles	"	"
509	" 19	Baldwin	Reed City Shingle & Lumber Co.	" " "	idle	......
510	" 19	Ludington	Percy Salt Works—No. 2	Salt	run.	full
511	" 19	"	Daneher & Melendy	Lumber	"	"
512	" 20	"	T. R. Lyon, Agent	Lumber and lath	"	"
513	" 20	"	Percy Salt Works—No. 1	Salt	"	"
514	" 20	"	Ludington Basket Co.	Fruit packages	"	"
515	" 20	"	Ludington Woodenware Co.	Bowls, handles, etc.	"	"
516	" 20	"	E. F. Rowe	Mops & wood novelties	"	"
517	" 22	"	Cartier Lumber Co.	Lumber and shingles	"	"
518	" 22	"	Percy Salt Works, No. 3	Salt	"	"
519	" 22	Buttersville	Butters & Peters Salt & Lum. Co.	Lumber and shingles	"	"
520	" 22	"	Butters & Peters Salt & Lum. Co.	Salt	"	"
521	" 22	"	Mason & Oceana R. R. Shops	Locomotive and car rep.	"	"
522	" 22	Ludington	Ludington Elec. L't & Power Co.	Electricity	"	"
523	" 22	"	Industrial Iron Works	Machinery	"	"
524	" 23	"	Tiedemann & Ungers	General woodwork	"	part
525	" 23	"	Davies Bros.	Boilers, etc.	idle	......
526	" 23	"	Ludington Iron Works	Machinery	run.	full
527	" 23	"	Pere Marquette Lumber Co.	Lumber	"	"
528	" 23	"	Pere Marquette Lumber Co.	Salt	"	"
529	" 23	"	M. A. Agens	General woodwork	"	"
530	" 23	"	Pierce Manufacturing Co.	Brooms	"	"
531	" 23	"	Ludington Milling Co.	Flour and feed	"	part
532	" 24	"	Ludington Democrat	Printed matter	"	full
533	" 24	"	Daily Mail	" "	"	"
534	" 24	"	Record Printing & Pub. Co.	" "	"	"
535	" 24	"	Wm. Kiesewalter	Feed	"	"
536	" 24	"	Star Steam Laundry	Laundry work	"	"
537	" 24	"	Ludington Appeal	Printed matter	"	"
538	" 24	"	Cartier Enameling Co.	Wood turning, etc.	"	part
539	" 24	"	Ludington Novelty Works	Wood novelties	idle	......
540	" 25	Scottville	Newy Formwell	Lumber	"	......
541	" 25	"	Almon Goon	General woodwork	run.	part
542	" 25	Custer	English & Cantwell	Lumber and staves	idle	......
543	" 25	"	Custer Manufacturing Co.	Clothes pins	"	......
544	" 25	Stearns	J. S. Stearns	Lumber	run.	full
545	" 25	"	J. S. Stearns	Dressed lum. & dim. st'k	"	"
546	" 26	Newaygo	Converse Manufacturing Co.	General woodwork	"	"
547	" 26	"	Converse Manufacturing Co.	Furniture	"	"
548	" 26	Bailey	* Britton & Larne	Fruit packages	"	"
549	" 26	Sparta	Sparta Brick and Tile Co.	Brick and tile	idle	......
550	" 26	"	Welch Folding Bed Co.	Folding beds	run.	full

* This firm has just started and is not in full operation.

District No. 3. *L. C. F. Hintz, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection	Average pay roll per month.	No. of children under 14 years of age employed.	No of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	35	15	....	$800	....	....	......	10	60	....	....	yes	yes	no	**	yes	yes	....	yes	....	....	501
60	..	20	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	502
60	60	68	68	....	2,300	....	....	......	10	60	....	....	yes	yes	no	**	yes	yes	....	yes	....	....	503
60	60	23	23	....	800	....	....	......	10	60	....	....	“	“	“	**	“	“	yes	“	....	....	504
60	60	94	94	....	4,400	....	....	......	10	60	....	....	“	“	“	**	“	“	....	“	....	....	505
50	60	14	14	....	§	....	....	......	10	60	....	....	....	“	“	**	“	“	yes	“	....	....	506
60	60	9	9	....	§	....	....	......	10	60	....	....	....	“	“	**	“	“	“	“	....	....	507
60	60	12	9	....	500	....	....	......	10	60	....	....	....	“	“	**	“	“	....	“	....	....	508
60	..	30	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	509
*	*	75	75	....	2,500	....	4	no	10	60	....	....	yes	yes	no	**	yes	yes	yes	yes	....	....	510
60	60	75	60	....	3,300	....	....	......	10	60	....	....	“	“	“	**	“	“	....	“	....	....	511
60	60	85	85	....	3,750	....	....	......	10	60	....	....	“	“	“	**	“	“	....	“	....	....	512
*	*	53	53	....	1,550	....	2	yes	10	60	....	....	“	“	“	**	“	“	....	“	....	....	513
60	60	135	77	33	1,500	1	17	‖	10	60	yes	no	no	“	“	**	“	no	yes	“	yes	....	514
60	60	45	31	9	1,500	....	2	yes	10	60	....	....	yes	“	“	yes	“	yes	“	“	“	....	515
60	60	12	5	....	160	....	2	no	10	60	....	....	no	“	“	**	“	no	....	“	....	....	516
60	60	74	74	....	3,050	....	....	......	10	60	....	....	yes	“	“	**	“	yes	....	“	....	....	517
*	*	30	30	....	1,000	....	....	......	10	60	....	....	“	“	“	**	....	“	....	“	....	....	518
60	60	65	65	....	2,600	....	1	no	10	60	....	....	“	“	“	**	yes	“	yes	“	....	....	519
*	*	50	46	4	1,800	....	....	......	10	60	....	....	“	“	“	**	“	“	....	“	yes	....	520
60	60	10	7	....	375	....	....	......	10	60	....	....	....	“	“	**	“	“	....	“	....	....	521
†	†	4	4	....	257	....	....	......	10	60	....	....	....	“	“	**	“	“	....	“	....	....	522
60	60	15	6	....	300	....	....	......	10	60	....	....	....	“	“	**	“	“	....	“	....	....	523
60	54	15	7	....	350	....	....	......	10	60	....	....	yes	“	“	yes	“	“	yes	“	....	....	524
60	..	30	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	525
60	60	35	11	....	400	....	....	......	10	60	....	....	yes	yes	no	**	yes	yes	yes	yes	....	....	526
60	60	55	55	....	2,000	....	....	......	10	60	....	....	“	“	“	**	“	no	....	“	....	....	527
60	60	62	62	....	2,500	....	....	......	10	60	....	....	“	“	“	**	“	yes	....	“	....	....	528
60	60	9	5	....	200	....	....	......	10	60	....	....	“	“	“	**	“	“	yes	“	....	....	529
60	60	12	8	....	250	....	....	......	10	60	....	....	“	“	“	**	....	....	....	“	....	....	530
*	‡	6	5	....	220	....	....	......	10	60	....	....	“	“	“	**	yes	yes	....	“	....	....	531
60	60	10	8	2	325	....	....	......	10	60	....	....	....	“	“	**	“	“	....	no	no	....	532
60	60	5	5	....	175	....	....	......	10	60	....	....	....	“	“	**	“	“	....	yes	....	....	533
60	60	5	4	....	175	....	....	......	10	60	....	....	yes	“	“	**	“	“	....	“	....	....	534
60	60	2	2	....	75	....	....	......	10	60	....	....	no	“	“	**	“	“	....	“	....	....	535
60	60	7	2	3	100	....	....	......	10	60	....	....	....	“	“	**	“	“	....	“	no	....	536
60	60	5	3	2	150	....	....	......	10	60	....	....	....	“	“	**	“	“	....	“	“	....	537
60	54	63	31	4	1,300	....	....	......	10	60	yes	....	yes	“	“	**	“	no	....	“	yes	....	538
60	..	3	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	539
60	..	11	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	540
60	30	6	2	....	75	....	....	......	10	60	....	....	....	yes	no	**	yes	yes	....	yes	....	....	541
60	..	25	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	542
60	..	35	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	543
60	60	90	90	....	¶	....	....	......	10	60	....	....	yes	yes	no	**	yes	no	yes	yes	....	....	544
60	60	180	180	....	10,000	4	5	yes	10	60	yes	yes	“	“	“	**	“	yes	“	“	....	....	545
60	60	12	2	....	100	....	....	......	10	60	....	....	“	“	“	**	“	“	“	“	....	....	546
60	60	175	43	....	1,400	....	2	yes	10	60	yes	yes	“	“	“	**	“	“	“	“	....	....	547
60	60	30	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	548
60	..	15	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	549
60	60	175	100	....	3,500	....	2	yes	10	50	yes	yes	yes	yes	no	no	yes	yes	yes	yes	....	....	550

*** 144 hours-running day and night.**
† Run when power is needed.
‡ 108 hours.

¶ Included in pay roll of 545.
§ Included in pay roll of No. 508.
‖ Not all.

**** None required.**

Inspection book No. 12. TABLE No. 8.—CONTINUED.—

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running is it full or part time?
551	Aug. 10	Childsdale	H. H. Childs	Strawboard and paper	run.	full
552	" 10	Rockford	Rockford Veneer Works	Lumber and veneer	idle	......
553	" 11	Luther	James Sterling	"	"	......
554	" 11	"	E. E. Crandall	Shingles	"	......
555	" 11	Haakville	J. H. & J. A. Haak	Lumber and dowels	run.	full
556	" 11	"	J. H. & J. A. Haak	Dimension stock	"	"
557	" 12	Cadillac	F. A. Diggins & Co.	Lumber	idle	......
558	" 12	"	Cobbs & Mitchell—Mill No. 1	Lumber and lath	run.	full
559	" 12	"	Cobbs & Mitchell—Mill No. 2	" " "	"	"
560	" 12	"	Haynes Bros.	Dressed lumber	"	"
561	" 12	"	Cadillac City Roller Mills	Flour and feed	"	"
562	" 12	"	Wilcox Bros.	Brick	idle	......
563	" 12	"	Lumsden & Ward	Dimension stock	"	......
564	" 13	"	White Star Steam Laundry	Laundry work	run.	full
565	" 13	"	Rybold & Clausen	Cigars	"	"
566	" 13	"	Wm. McAdie & Co.	Machinery	"	"
567	" 13	"	Cadillac Steam Laundry	Laundry work	"	"
568	" 13	"	Wm. Hayes	Boilers, etc.	"	"
569	" 13	"	Cadillac Light & Water Co.	Electricity	"	"
570	" 13	"	Cummer & Diggins—Mill No. 1	Lumber and lath	"	"
571	" 13	"	Cummer & Diggins—Mill No. 2	"	"	"
572	" 13	"	Cummer Manufacturing Co.	Interior finish, etc.	"	"
573	" 14	"	Blodgett, Cummer & Diggins	Dressed lumber	"	"
574	" 14	"	C. M. Oviatt Manufacturing Co.	Fruit packages	"	"
575	" 14	"	Cadillac Handle Co.	Broom handles	"	"
576	" 14	"	Cadillac Stave Co.	Staves and heading	"	"
577	" 14	Manton	Williams Bros.	Last blocks	"	"
578	" 14	"	A. Green & Son	Dressed lumber, etc.	"	"
579	" 14	"	O. C. Kraft	Lumber	"	"
580	" 14	"	Truman Bros	Lumber and shingles	idle	......
581	" 15	Harrietta	H. M. Patrick	Handles and shingles	"	......
582	" 15	"	P. G. Buckel & Co.	Lumber	"	......
583	" 15	"	Harrietta Stave Co.	Staves and lumber	"	......
584	" 15	"	Harrietta Brick Co.	Brick	run.	full
585	" 15	Yuma	Southern Chemical Co.	Alcohol and acetate of lime.	"	"
586	" 15	"	Mrs. Mary Bailey	Lumber	idle	......
587	" 15	Mesick	L. F. Tripp	Broom handles	"	......
588	" 15	"	Smith & Son	Lumber	"	......
589	" 15	Sherman	F. M. Wheeler	Lumber and shingles	run.	full
590	" 15	"	M. J. Claggett & Co.	Staves and heading	"	"
591	" 17	Lake Ann	Elton & Thompson	Lumber	idle	......
592	" 17	"	Wm. Habbeler	"	"	......
593	" 17	"	Wm. Habbeler	Staves and heading	run.	full
594	" 18	Empire	Empire Lumber Co.	Lumber	"	"
595	" 18	"	Empire Lumber Co.	Shingles	idle	......
596	" 18	Honor	Guelph Patent Cask Co.	Veneer	run.	full
597	" 19	Copemish	Franz Krein	Hames and trunk slats.	"	"
598	" 19	"	Chapman & Sargent	Bowls and trays.	"	"
599	" 19	"	M. T. Crimmins	Lumber and shingles	"	"
600	" 19	Nessen City	Gard & Hislop	"	idle	......

District No. 3. *L. C. F. Hintz, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
*	*	40	25	----	$800	----	----	------	10	60	----	----	yes	yes	no	†	yes	no	----	yes	----	----	551
60	--	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	552
60	--	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	553
60	--	11	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	554
60	60	24	24	----	686	----	2	yes	10	60	----	----	yes	yes	no	†	yes	no	---	no	----	1	555
60	60	21	21	----	580	----	----	------	10	60	----	----	----	"	"	†	"	"	yes	"	----	----	556
60		37	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	557
60	60	40	40	----	1,700	----	----	------	10	60	----	----	yes	yes	no	†	yes	yes	----	yes	----	----	558
60	60	67	67	----	2,850	----	----	------	10	60	----	----	"	"	"	†	"	"	----	"	----	----	559
60	60	25	18	----	600	----	----	------	10	60	----	----	----	"	"	†	"	"	yes	"	----	1	560
60	60	7	6	----	225	----	----	------	10	60	----	----	yes	"	"	†	"	"	----	"	----	----	561
60	--	22	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	562
60	--	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	563
60	60	7	3	3	100	----	----	------	10	60	----	----	----	yes	no	†	yes	yes	----	yes	no	----	564
48	48	15	12	3	600	----	----	------	8	60	----	----	----	"	"	†	----	----	----	"	yes	----	565
57	57	25	15	---	650	----	----	------	9½	60	----	----	yes	"	"	†	yes	yes	----	"	----	----	566
60	60	7	2	3	100	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	yes	1	567
60	60	10	4	----	260	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	----	----	568
*	*	9	9	----	468	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	----	----	569
60	60	96	96	----	3,262	1	----	------	10	60	----	----	no	"	"	†	"	no	----	"	----	1	570
60	60	95	95	----	2,985	----	----	------	10	60	----	----	yes	"	"	†	"	yes	----	"	----	---	571
60	60	20	18	----	500	----	----	------	10	60	----	----	"	"	"	†	"	"	yes	"	----	----	572
60	60	67	67	----	1,750	----	----	------	10	60	----	----	----	"	"	†	"	"	"	"	----	----	573
60	60	130	127	3	2,500	5	10	no	10	60	----	----	yes	"	"	†	"	no	"	"	yes	1	574
60	60	50	34	----	1,700	----	----	------	10	60	----	----	"	"	"	†	"	yes	----	"	----	----	575
60	60	74	38	----	2,000	----	----	------	10	60	----	----	----	"	"	†	"	"	yes	"	----	----	576
60	60	28	28	----	1,000	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	----	----	577
60	60	15	7	----	235	----	----	------	10	60	----	----	----	"	"	†	"	"	yes	"	----	----	578
60	60	32	18	----	650	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	----	----	579
60	--	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	580
60	--	13	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	581
60	--	30	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	582
60	--	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	583
60	60	14	14	----	400	----	----	------	10	60	----	----	----	yes	no	†	yes	yes	----	yes	----	----	584
*	*	23	23	----	1,000	----	----	------	10	60	----	----	yes	"	"	†	"	"	----	"	----	1	585
60	--	8	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	586
60	--	10	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	587
60	--	18	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	588
60	60	20	20	----	780	----	----	------	10	60	----	----	----	yes	no	†	yes	yes	----	yes	----	----	589
60	60	40	30	----	1,300	----	----	------	10	60	----	----	----	"	"	†	"	no	----	"	----	----	590
60	--	14	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	591
60	--	35	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	592
60	60	45	24	----	520	----	----	------	10	60	----	----	----	yes	no	†	yes	yes	yes	yes	----	----	593
60	60	150	150	----	5,000	----	----	------	10	60	----	----	yes	"	"	†	"	"	----	"	----	1	594
60	--	30	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	595
60	60	83	83	----	2,000	1	8	no	10	60	----	----	----	yes	no	†	yes	no	----	yes	----	----	596
60	60	32	20	----	750	----	----	------	10	60	----	----	----	"	"	†	"	yes	yes	"	----	----	597
60	60	9	9	----	300	----	----	------	10	60	----	----	----	"	"	†	"	no	----	"	----	----	598
60	60	7	6	----	200	----	----	------	10	60	----	----	----	"	"	†	"	yes	----	"	----	----	599
60	--	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	600

* 144 hours-running day and night.

† None required.

Inspection book No. 13. **TABLE No. 8.—Continued.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
601	Aug. 19	Nessen City	De Armond, Obermeyer & Co.	Lumber and hame sticks	idle	......
602	" 19	"	W. M. McKeague	Lumber and shingles	run.	full
603	" 19	Thomps'nv'le	Thompson Lumber Co.	"	idle	......
604	" 19	"	William Phelps	"	run.	full
605	" 19	"	Delaney & Hyatt	Lumber and handles	"	"
606	" 19	"	I. W. Bowen	Shingles	idle	......
607	" 20	S. Frankfort	Crane Lumber Co.	Lumber	run.	full
608	" 20	"	Crane Lumber Co.	Maple flooring	idle	......
609	" 20	Frankfort	D. B. Butler	Lumber	run.	full
610	" 20	"	H. A. Hills	Dressed lumber	"	"
611	" 20	"	Bellows Bros.	Lumber	"	"
612	" 20	"	F. A. Markham	Machinery and castings	idle	......
613	" 20	"	J. Courville	General woodwork	run.	full
614	" 20	"	Frankfort Refrigerator Co.	Refrigerators	idle	......
615	" 21	Arcadia	Henry Stark Land & Lumber Co.	Lum. & dimension stock	run.	full
616	" 21	Bear Lake	George W. Hopkins	Lumber	"	"
617	" 21	Onekama	Onekama Lumber Co.	"	"	"
618	Sept. 15	Manistee	Canfield & Wheeler Co.	"	"	"
619	" 15	"	Canfield & Wheeler Co.	Salt	"	"
620	" 15	"	Daniel Jensen	General woodwork	idle	......
621	" 15	"	Electrical Mfg. Supply Co.	Telephones, etc.	"	......
622	" 15	"	Aug. N. Johnson	Machinery	run.	full
623	" 15	"	Nels Johnson	Tower clocks	"	"
624	" 15	"	S. C. Overpack	Wagons and trucks	"	"
625	" 15	"	News Publishing Co.	Printed matter	"	"
626	" 16	"	Manistee Printing Co.	" "	"	"
627	" 16	"	Manistee Advocate	" "	"	"
628	" 16	"	Comfort Bros.	Cigars	"	"
629	" 16	"	James Finan	"	"	"
630	" 16	"	Joseph Kirster	"	"	"
631	" 16	"	City Steam Laundry	Laundry work	"	"
632	" 16	"	R. J. B. Newcombe	General woodwork	"	"
633	" 16	"	C. O. D. Steam Laundry	Laundry work	"	"
634	" 16	"	Frank C. Hall	Cigars	"	"
635	" 16	"	Henry E. Roy	"	"	"
636	" 16	"	Joseph Broadhead	Saws	"	"
637	" 17	"	Patrick Noud	Lumber and shingles	"	"
638	" 21	"	Michigan Iron Works	Machinery and castings	idle	......
639	" 21	"	Union Boiler Works	Boilers, etc.	"	......
640	" 21	"	Manistee Brewing Co.	Lager beer	run.	full
641	" 21	"	Manistee Iron Works Co.	Machinery	"	"
642	" 21	"	Sands Electric Light Co.	Electricity	"	"
643	" 21	"	Louis Sands	Lumber and lath	"	"
644	" 21	"	Louis Sands	Salt	"	"
645	" 21	"	Louis Sands	Shingles	"	"
646	" 21	"	William Batty	Saws	"	part
647	" 22	"	M. & N. E. R. R. Shops	Locomotives & car rep's	"	full
648	" 22	"	Buckley & Douglas Lumber Co.	Lumber and shingles	"	"
649	" 22	"	Filer & Sons	Salt	"	"
650	" 22	"	State Lumber Co.	Lumber and shingles	"	"

District No. 3. *L. C. F. Hintz, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	--	----	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	601
60	60	13	13	----	$520	----	----	------	10	60	----	----	----	yes	no	†	yes	no	----	yes	----	----	602
60	--	50	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	603
60	60	12	12	----	400	----	----	------	10	60	----	----	----	yes	no	†	yes	yes	----	yes	----	----	604
60	60	6	6	----	230	----	----	------	10	60	----	----	----	"	"	†	"	no	----	"	----	----	605
60	--	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	606
60	60	84	84	----	2,500	----	----	------	10	60	----	----	yes	yes	no	†	yes	yes	----	yes	----	----	607
60	--	----	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	608
60	60	32	32	----	1,400	----	----	------	10	60	----	----	no	yes	no	†	yes	no	----	yes	----	----	609
60	60	6	3	----	235	----	----	------	10	60	----	----	----	"	"	†	"	yes	yes	"	----	----	610
60	60	32	32	----	1,300	----	----	------	10	60	---	----	yes	"	"	†	"	"	----	"	----	----	611
60	--	10	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	612
60	60	7	8	----	150	----	----	------	10	60	--	----	----	yes	no	†	yes	yes	yes	yes	----	----	613
60	--	30	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	614
60	60	40	40	----	1,500	----	----	------	10	60	----	----	yes	yes	no	†	yes	yes	----	yes	----	1	615
60	60	35	35	----	1,800	----	----	------	10	60	----	----	"	"	"	†	"	"	----	"	----	----	616
60	60	30	30	----	1,800	----	----	------	10	60	----	----	"	"	"	†	"	"	yes	"	----	----	617
60	60	114	114	---	3,800	----	----	------	10	60	----	----	"	"	"	†	"	"	----	"	----	----	618
60	60	51	81	20	1,650	----	----	------	10	60	----	----	"	"	"	†	"	"	----	"	yes	----	619
60	--	7	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	620
60	--	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	621
60	60	25	11	1	560	----	----	------	10	60	----	----	----	yes	no	†	yes	yes	----	yes	yes	----	622
60	60	3	3	----	180	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	----	----	623
60	60	13	9	----	525	----	----	------	10	60	----	----	yes	"	"	†	----	----	----	"	----	----	624
60	60	12	7	5	550	----	----	------	10	60	----	----	"	"	"	†	yes	yes	----	"	yes	----	625
60	60	4	2	----	100	----	----	------	10	60	----	----	"	"	"	†	"	"	----	"	----	----	626
60	60	6	3	3	150	----	----	------	10	60	----	----	no	"	"	†	"	no	----	"	yes	----	627
48	48	18	7	2	350	----	----	------	8	60	----	----	yes	"	"	†	----	----	----	"	"	----	628
48	48	4	2	----	140	----	----	------	8	60	----	----	"	"	"	†	----	----	----	"	----	----	629
48	48	8	8	----	400	----	----	------	8	60	----	----	"	"	"	†	----	----	----	"	----	----	630
60	60	10	4	4	180	----	----	------	10	60	----	---	"	"	"	†	yes	yes	----	"	yes	----	631
60	60	40	7	----	400	----	----	------	10	60	----	----	"	"	"	†	"	"	yes	"	----	----	632
60	60	22	5	7	800	----	----	------	10	60	----	----	---	"	"	†	"	"	----	"	yes	----	633
48	48	8	4	----	200	----	----	------	8	60	----	----	yes	"	"	†	----	----	----	"	----	----	634
48	48	11	3	----	100	----	----	------	8	60	----	----	----	"	"	†	----	----	----	"	----	----	635
60	60	10	4	----	300	----	----	------	10	60	----	----	yes	"	"	†	yes	yes	----	"	----	----	636
60	60	50	39	----	2,000	----	1	no	10	60	----	----	"	"	"	†	"	"	-- -	"	----	----	637
60	--	10	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	638
60	--	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	639
60	60	9	9	----	460	----	----	------	10	60	----	----	yes	yes	no	†	yes	yes	----	yes	----	----	640
60	60	100	40	----	3,000	----	----	------	10	60	----	----	no	"	"	†	"	"	----	"	----	----	641
72	72	13	18	----	650	----	----	------	10	60	----	----	yes	"	"	†	"	"	----	"	----	----	642
60	60	144	144	----	4,700	----	----	------	10	60	----	----	"	"	"	†	"	"	----	"	----	----	643
60	60	76	76	----	2,585	----	----	------	10	60	----	----	"	"	"	†	"	"	----	"	----	----	644
60	60	77	77	----	3,150	2	1	no	10	60	----	----	"	"	"	†	"	"	yes	"	----	----	645
60	54	4	3	----	175	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	----	----	646
60	60	18	12	----	950	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	----	----	647
60	60	450	375	----	12,500	----	----	------	10	60	----	----	yes	"	"	†	"	"	yes	"	----	1	648
60	60	100	*	----	------	----	----	------	10	60	----	----	"	"	"	†	"	"	----	no	----	----	649
60	60	180	180	----	6,000	----	----	------	10	60	----	----	"	"	"	†	"	"	----	yes	----	----	650

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* Largest salt block in U. S., but had just started up at time of inspection. † None required.

Inspection book No. 14. **TABLE No. 8.—Continued.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
651	Sept. 22	Manistee	State Lumber Co.	Salt	run.	full
652	" 22	"	M. F. C. & E. R'y	Electricity and repairs	"	"
653	" 22	"	Babcock Lumber Co.	Shingles	"	"
654	" 22	"	M. Robertson Leather Co.	Leather	"	"
655	" 23	"	J. O. Nessen, Agent	Lumber and shingles	"	"
656	" 23	"	J. O. Nessen, Agent	Salt	"	"
657	" 23	Filer City	Filer & Sons	Lumber, lath & shingles	"	"
658	" 23	"	Filer & Sons	Salt	"	"
659	" 23	Stronach	Union Lumber & Salt Co.	Lumber and shingles	"	"
660	" 23	"	Union Lumber & Salt Co.	Salt	"	"
661	" 23	"	M. A. Hopper	Lumber and shingles	"	"
662	" 24	Manistee	Manistee Manufacturing Co.	Furniture	"	"
663	" 24	"	Manistee Emery Wheel Co.	Emery wheels	"	"
664	" 24	"	City Planing Mill	General woodwork	"	"
665	" 24	"	Eureka Lumber Co.	Lumber	idle	......
666	" 24	"	Eureka Lumber Co.	Salt	"	......
667	" 24	"	Manistee Lumber Co.	Lumber and lath	run.	full
668	" 24	East Lake	Canfield Salt & Lumber Co.	Salt	"	"
669	" 24	"	Canfield Salt & Lumber Co.	Lumber and lath	"	"
670	" 25	"	R. G. Peters Salt & Lumber Co.	Lumber, shingles & lath	"	"
671	" 25	"	R. G. Peters Salt & Lumber Co.	Salt	"	"
672	" 25	"	Canfield Salt & Lumber Co.	Lumber and shingles	"	"
673	" 25	"	Canfield Salt & Lumber Co.	Salt	"	"
674	Oct. 3	Cedar Sprin's	George W. Sharer	Staves and heading	idle	......
675	" 3	"	Wordan Manufacturing Co.	General woodwork	run.	full
676	" 19	Lowell	Superior Mills	Flour and feed	"	"
677	" 19	"	Forest Mills	" "	"	part
678	" 19	"	Lowell Woolen Mills	Woolen goods	idle	......
679	" 19	"	Lowell Cutter Co.	Cutter and buggy bodies	run.	full
680	" 19	"	W. J. Ecker & Son	General woodwork	"	"
681	" 19	Ionia	State House of Correction	Furniture & knit goods	"	"
682	" 20	"	Ionia Furniture Co.	"	idle	......
683	" 20	"	Ionia City Mills	Flour and feed	run.	part
684	" 20	"	S. C. Waters	Machinery and castings	"	"
685	" 20	"	R. Hearsey	General woodwork	"	full
686	" 20	"	Ionia Electric Co.	Electricity	"	"
687	" 20	"	Michigan Clothing Co.	Clothing	"	"
688	" 20	"	Capital Wagon Works	Wagons	idle	......
689	" 20	"	G. F. Fande	Cigars	run.	full
690	" 20	"	Ionia City Brewery	Lager beer	"	"
691	" 21	"	Ionia City Steam Laundry	Laundry work	"	"
692	" 21	"	Ionia Sentinel	Newspaper	"	"
693	" 21	"	Ionia Gas Light & Coke Co.	Gas and coke	"	"
694	" 21	"	Ionia Pottery Co.	Flower pots, vases, etc.	idle	......
695	" 21	"	Williams Manufacturing Co.	General woodwork	run.	part
696	" 21	"	D. L. & N. R. R. Shops	Locomotive & car rep.	"	full
697	" 21	Belding	Welch Casket Co.	Caskets	"	part
698	" 21	"	Belding Shoe Co.	Shoes	"	full
699	" 22	"	Belding Mfg. Co. (Factory B)	Refrigerators, etc.	"	"
700	" 22	"	Belding Bros. & Co.	Silk thread	"	part

District No. 3. ***L. C. F. Hintz, Deputy Inspector.***

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water-closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	70	70	----	$2,600	2	2	yes	10	60	----	----	yes	yes	no	¶	yes	yes	yes	yes	----	----	651
*	*	8	8	----	395	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	----	----	652
60	60	50	50	----	1,800	----	----	------	10	60	----	----	yes	"	"	¶	"	"	----	"	----	----	653
60	60	75	27	1	300	----	----	------	10	60	no	no	no	"	"	¶	"	"	----	"	yes	----	654
60	60	88	88	----	1,800	----	----	------	10	60	----	----	yes	"	"	¶	"	no	----	"	----	----	655
60	60	65	65	----	1,900	1	2	yes	10	60	----	----	no	"	"	¶	"	yes	----	"	----	----	656
60	60	108	93	----	3,200	----	----	------	10	60	----	----	yes	"	"	¶	"	"	----	"	----	----	657
60	60	45	42	----	1,400	----	2	yes	10	60	----	----	"	"	"	¶	"	"	----	"	----	----	658
60	60	120	61	----	2,650	----	----		10	60	----	----	"	"	"	¶	"	"	----	"	----	----	659
60	60	50	44	----	1,500	----	3	yes	10	60	----	----	"	"	"	¶	"	"	----	"	----	----	660
60	60	85	55	----	2,200	----	----	------	10	60	----	----	no	"	"	¶	"	"	----	"	----	----	661
60	60	85	30	----	1,600	----	6	yes	10	60	yes	yes	yes	"	"	¶	"	no	yes	"	----	----	662
60	60	4	1	----	100	----	----	------	10	60	----	----	----	"	"	¶	"	yes	"	"	--	----	663
60	60	8	2	----	100	----	----	------	10	60	----	----	yes	"	"	¶	"	"	"	no	----	----	664
60	--	115	----	----	------	----	----	------	----	----	----	----	----	----	---	---	----	----	----	----	----	----	665
60	--	50	----	----	------	----	----	------	----	----	----	----	----	----	----		----	----	----	----	----	----	666
60	60	83	83	----	3,000	----	3	no	10	60	----	----	yes	yes	no	¶	yes	no	----	yes	---	----	667
60	60	34	34	----	1,000	----	----	------	10	60	----	----	---	"	"	¶	"	yes	----	"	----	----	668
60	60	56	56	----	2,000	----	----	------	10	60	----	----	yes	"	"	¶	"	"	yes	"	----	----	669
60	60	400	400	----	13,500	----	----	------	10	60	----	----	"	"	"	¶	"	"	----	"	----	----	670
60	60	192	192	----	5,100	1	2	no	10	60	----	----	"	"	"	¶	"	no	yes	"	----	----	671
60	60	203	193	----	5,100	----	----	------	10	60	----	----	"	"	"	¶	"	yes	"	"	----	----	672
60	60	47	47	----	1,300	---	2	yes	10	60	----	---	"	"	"	¶	"	"	----	"	----	----	673
60	--	20	----	----	------	---	----	------	----	---	----	----	----	----	----	----	----	----	----	----	----	----	674
60	60	6	6	----	240	----	----	------	10	60	----	----	yes	yes	no	¶	yes	yes	yes	yes	----	----	675
†	†	8	8	----	400	----	----	------	10	60	----	----	no	"	"	¶	"	"	----	"	----	----	676
‡	60	7	7	----	200	----	----	------	10	60	----	----	yes	"	"	¶	"	"	----	"	----	----	677
60	--	5	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	678
60	60	55	15	----	2,250	----	----	------	10	60	----	----	no	yes	no	¶	yes	no	yes	yes	----	----	679
60	60	9	6	----	200	----	----	------	10	60	----	----	yes	"	"	¶	"	yes	"	"	----	----	680
60	60	345	345	----	------	----	----	------	10	60	yes	no	"	"	"	yes	"	"	"	"	----	----	681
60	--	115	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	682
60	48	5	3	----	100	----	----	------	10	60	----	----	yes	yes	no	¶	yes	yes	----	yes	----	----	683
60	48	8	4	----	120	----	----	------	10	60	----	----	no	"	"	¶	"	"	----	"	----	----	684
60	60	4	2	----	100	----	----	------	10	60	----	----	----	"	"	¶	"	"	yes	"	----	----	685
§	§	6	6	----	300	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	----	----	686
60	60	130	30	100	3,000	----	----	------	10	60	yes	yes	yes	"	"	yes	"	"	----	"	yes	----	687
60	--	115	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	688
48	48	18	12	----	400	----	----	------	8	60	----	----	----	yes	no	¶	----	----	----	yes	----	----	689
60	60	6	6	----	330	----	----	------	10	60	---	----	no	"	"	¶	yes	no	----	"	----	----	690
60	60	10	6	4	224	----	----	------	10	60	----	----	----	"	"	¶	"	yes	----	"	yes	----	691
60	60	9	5	2	200	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	"	----	692
†	†	5	5	----	250	----	----	------	10	60	----	----	yes	"	"	¶	"	"	----	"	----	----	693
60	--	14	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	694
60	54	18	16	----	500	----	----	------	10	60	----	----	----	yes	no	¶	yes	yes	yes	yes	----	----	695
60	60	160	160	----	6,000	----	----	------	10	60	----	----	yes	"	"	¶	"	"	"	"	----	2	696
60	48	60	23	2	750	----	----	------	10	60	yes	yes	"	"	"	¶	"	no	"	"	yes	----	697
60	60	30	20	10	1,000	----	1	no	10	60	----	----	"	"	"	¶	"	"	"	"	"	----	698
60	60	70	40	----	1,700	----	----	------	10	60	yes	yes	"	"	"	¶	"	yes	"	"	----	----	699
60	48	350	24	49	1,200	----	----	------	10	60	"	"	"	"	"	yes	"	"	----	"	yes	----	700

* 108 hours.
† 144 hours-running day and night.
‡ 144 hours.
§ Run when light is needed.

¶ None required.

Inspection book No. 15. TABLE No. 8.—Concluded.—

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
701	Oct. 22	Belding	Belding Mfg. Co. (Factory A.)	Refrigerators	idle	......
702	" 22	"	Ballou Basket Co	Baskets	run.	full
703	" 22	"	Grand Rapids Paper Box Co.	Paper boxes	"	part
704	" 22	"	Wilson, Dimmick & Sinclair	General woodwork	"	"
705	" 22	"	Richardson Silk Co.	Silk thread and braid	"	full
706	" 22	"	Belding Flour Mills	Flour and feed	"	"
707	Nov. 5	Freeport	Cool & Curtis	General woodwork	idle	......
708	" 5	"	Job Cheesebrough	Handles, rakes, etc.	"	......
709	" 5	"	W. Fox & Sons	General woodwork	run.	part
710	" 5	Lake Odessa	A. Heath & Son	" "	idle	......
711	" 5	"	Lake Odessa Mfg. Co.	Washing machines	"	......
712	" 6	Portland	Portland Furniture Co.	Tables	run.	full
713	" 6	"	Portland Mfg. Co.	Washing machines	"	"
714	" 6	"	Portland Milling Co.	Flour and feed	"	"
715	" 6	"	O. E. Robinson	Barrels	"	"
716	" 6	"	Wolverine Soap Co.	Soap	"	"
717	" 6	"	Banfield Furniture Co.	Furniture	"	"
718	" 6	"	W. F. Selleck	Lumber, feed and cider	"	"
719	" 6	Lyons	Beach Mfg. Co.	Gen. woodw'k & casting	"	"
720	" 6	"	Gothic Mills	Flour and feed	"	part
721	" 7	Muir	Muir Washing Machine Co.	Washing machines	idle	......
722	" 7	St. Johns	St. Johns Iron Works	Boilers and engines	run.	full
723	" 7	"	St. Johns Mfg. Co.	Tables	"	part
724	" 7	"	St. Johns Spring Co.	Agricultural springs	"	"
725	" 7	Ovid	Ovid Carriage Co.	Buggies and cutters	idle	......

District No. 3. *L. C. F. Hintz, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	..	145	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	701
60	60	60	40	----	$1,800	----	----	------	10	60	yes	yes	yes	yes	no	‡	yes	yes	yes	yes	----	----	702
60	48	20	1	18	200	----	----	------	10	60	"	----	"	"	"	‡	"	"	----	"	yes	----	703
60	54	20	10	----	800	----	----	------	10	60	-- -	----	"	"	"	‡	"	"	yes	"	----	----	704
60	60	850	25	100	4,000	----	8	yes	10	60	yes	yes	"	"	"	yes	"	"	----	"	yes	----	705
*	*	11	9	1	420	----	----	------	10	60	----	----	"	"	"	‡	"	"	----	"	"	----	706
60	--	14	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	1	707
60	..	18	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	708
60	42	6	6	----	175	----	----	------	10	60	----	----	yes	yes	no	‡	yes	no	----	yes	----	----	709
60	--	6	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	---	710
60	..	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	711
60	60	84	84	----	1,000	----	----	------	10	60	----	----	no	yes	no	‡	yes	yes	no	yes	----	----	712
60	60	25	22	1	550	----	----	------	10	60	----	----	yes	"	"	‡	"	no	yes	"	----	1	713
*	*	17	17	----	660	----	----	------	10	60	----	----	"	"	"	‡	"	yes	----	"	----	----	714
60	60	17	14	----	450	----	----	------	10	60	----	----	----	"	"	‡	----	----	----	"	----	----	715
60	60	8	4	1	175	----	----	------	10	60	yes	----	no	"	"	‡	----	yes	----	"	yes	----	716
60	60	15	2	----	100	----	----	------	10	60	----	----	yes	"	"	‡	yes	"	----	"	----	----	717
60	60	23	23	----	800	----	----	------	10	60	----	----	----	"	"	‡	"	"	----	"	----	----	718
60	60	7	4	----	160	----	----	------	10	60	----	----	yes	"	"	‡	"	"	----	"	----	2	719
*	72	9	7	----	280	----	----	------	10	60	----	----	"	"	"	‡	"	"	----	"	----	----	720
60	..	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	721
60	60	10	5	----	200	----	----	------	10	60	----	----	no	yes	no	‡	yes	yes	----	yes	----	----	722
60	54	800	250	----	6,000	----	----	------	10	60	yes	yes	yes	"	"	yes	"	"	yes	"	----	----	723
60	54	25	25	----	800	----	----	------	10	60	----	----	----	"	"	‡	"	"	----	"	----	----	724
60	..	80	----	----	------	----	----	------	----	----	----	----	----	----	---	----	----	----	----	----	----	----	725

* 144-running day and night.

‡ None required.

DEDUCTION FROM THE WORK IN DISTRICT NO. 3.

Organization of District.

The third factory inspection district for the year 1896 is a very important one, embracing the great manufacturing center of Grand Rapids, where the office of the Inspector is located. There are twelve counties in the district, as follows:

Benzie,
Clinton,
Ionia,
Kent,
Lake,
Manistee,
Mason,
Muskegon,
Newaygo,
Oceana,
Ottawa,
Wexford.

Factories Inspected.

During the year there were 725 factories inspected, of which 635 were running, and 90 were idle. Of these, 564 were running full time, and 71 only part time.

This shows that over 12 per cent of the factories were idle as compared with 8 per cent in 1895. Of those running, over 11 per cent were running on part time, as against 10 per cent in 1895.

Hours of Labor per Week.

Hours per week, when running full time	45,324
Hours per week at date of inspection	38,882
Hours lost per week	6,442

This is a loss to labor of over 644 days every week, or a daily loss of over 107 days of 10 hours each. Computed at $1.31 per day, the average daily wages paid for all labor by these factories, and it means a daily financial loss of about $140.20, or a yearly loss of $43,882.60.

As to Employes and Pay.

Number employed if running full capacity,	34,356
Number employed at date of inspection	24,302
Number less full capacity	10,054

Here is found an enormous loss to labor as compared with the full capacity of these factories, amounting to 10,054 employés. Computing their wages at the average paid during the year, the loss in dollars and cents daily is $13,170.74, or an annual loss of $3,122,441.62. Add to this the annual loss of $43,882.60, by reason of running short time, and the annual loss to labor in these factories alone amounts to $3,166,324.22.

Number males employed	22,345
Number females employed	1,957
Whole number employed	24,302

Number factories employing females	207	

Total monthly pay roll of factories running	$826,588 00
Average monthly pay roll of factories running	1,301 71
Average monthly pay per employé	34 05
Average daily pay per employé	1 31

Child Labor.

Number factories found employing children under 14	11
Number children under 14 found employed	20
Number children under 14 discharged	20
Number factories employing children between 14 and 16	82
Number children between 14 and 16 employed	300

Number factories where statements as to age were filed	51
Number factories where statements as to age were not filed	26
Number factories where statements as to age were filed for part	5
Whole number factories employing children as above	82

It will be seen that only 11 children under 14 were found employed as against 21 in 1895, and that only 20 factories employed such children, as compared with 40 in 1895.

In the matter of employing children between the ages of 14 and 16, there were only 82 factories where this kind of labor was found as against 140 in 1895, while the children of this class found employed was only 300, as compared with 472 in 1895, a reduction of over 36 per cent. Factories employing children have generally complied with the law as regards filing statements and keeping registers of such children. Those where statements were not filed, promised to immediately comply with the law.

Not a factory was found where males under 18 and females under 21 were allowed to clean machinery while in motion.

No factory was found where males under 18 and females under 21 were required to work over 60 hours per week.

Number factories working 10 hours per day	593
Number factories working 9½ hours per day	2
Number factories working 9 hours per day	17
Number factories working 8 hours per day	23
Whole number factories running	635

It will be seen that nearly all these factories work on the 10 hour day system, the few dropping below this makes the average day's work in the factories in this district 9.9 hours.

Dinner Hour.

Number factories that allow 60 minutes for dinner	478
Number factories that allow 50 minutes for dinner	139
Number factories that allow 45 minutes for dinner	4
Number factories that allow 30 minutes for dinner	7
Number factories that allow 25 minutes for dinner	7
Whole number factories running	635

The common, accepted time given employés for dinner is one hour, but in some instances this is shortened. In no case was less than 45 minutes allowed, except by permission of the inspector.

Hoisting Shafts, Well Holes and Elevator Protection.

Number factories where hoisting shafts and well holes were properly protected	185
Number factories not having hoisting shafts or well holes	448
Number ordered protected	2
Whole number factories running	635

Number factories where elevators were protected	124
Number factories not having elevators	467
Number ordered protected	44
Whole number factories running	635

This shows a large per cent of increase in this class of protection, as compared with 1895, when 13 orders were made for hoisting shafts and well hole protection, and 63 for automatic protection for elevators. Employers are quick to realize that their own protection lies in the safety of their employés.

Stair Protection.

Number factories where stairs were protected	440
Number factories where stairs were not protected	40
Number factories having no stairs	155
Whole number factories running	635

Protection to stairs covers any point where the safety of employés is in question—rubber for steps, handrails, properly screened at side and bottom where females are employed, etc. The percentage of protection over previous years is large.

Doors.

Number factories where doors swing outward or slide	632
Number factories where it is not practicable for doors to swing outward or slide	3
Whole number factories running	635

Number factories where doors are not locked or bolted during working hours	632
Number factories where doors are locked or bolted during working hours	3
Whole number factories inspected	635

It will be seen that in no case was the law regarding doors swinging outward or sliding evaded, there being three places found where it was not practical for them to be so adjusted.

Only three places were found where doors were locked or bolted during working hours. In all these places orders were given that this custom be discontinued.

Fire Escapes.

Number factories where fire escapes are not necessary	513
Number factories where fire escapes are provided	113
Number orders made	9
Whole number factories running	635

In 1895, 27 factories were inspected where fire escapes were ordered. This indicates that each year this necessary protection is provided more and more for employes working in buildings of two or more stories high. The inspector in this district has been watchful regarding this, and this year's report shows the utility of his work.

Machinery, etc.

Number factories where shifters were used for throwing belts, and where loose pulleys were provided	515
Number factories where such shifters and loose pulleys were not necessary	114
Number orders made	6
Whole number factories running	635

Number factories where vats, pans, saws and machinery were properly protected	449
Number factories where such vats, pans, saws, etc., were not used	107
Number orders made	79
Whole number factories running	635

This shows a marked increase of protection to employés from dangerous machinery, vats, pans, saws, etc., over 1895. The inspector was very careful regarding the inspection of all classes of machinery, especially the smaller parts, such as set screws, small belts, etc., which sometimes escape notice, but are no less dangerous.

Sanitary.

Number factories where dust arresters are provided	153
Number factories where dust arresters are not necessary	466
Number factories where orders were made	16
Whole number factories running	635

It will be seen that as compared with 1895 there was only about one-quarter the orders found necessary in regard to this important protection from dust Systems of exhaust fans are being constantly looked after.

Number factories having suitable washrooms and water closets....	623
Number factories not having suitable wash rooms and water closets.	12
Whole number factories running..........................	635

It is more and more realized that convenient and suitable wash rooms and water closets are important adjuncts to any factory, and but very few places are now found without them.

Number factories where separate water closets for females are not necessary	433
Number factories where separate water closets for females are provided	181
Number where separate water closets for females are not provided..	21
Whole number factories running..........................	635

The inspector was very particular regarding anything pertaining to the health and convenience of employés. Personal investigation shows a marked improvement along this line. The demands of the law are generally cheerfully acquiesced in, employers realizing the necessity, as well as the employed.

Accidents.

The accidents in this district for the past year number 53, as against 88 in 1895, a reduction of 35, or nearly 40 per cent. The fatal accidents in 1895 were six, as compared with two in 1896. This is a most satisfactory showing and is indisputable evidence of the utility of factory inspection.

Remarks.

Most interesting comparisons can be made by a study of the table, and a great deal of information can be obtained not enumerated in these deductions.

The changes ordered by the inspector and a narrative synopsis of the accidents during the year follow this. The number by which each are designated refers to the number given the factory in the table.

CHANGES ORDERED DURING YEAR.

DISTRICT NO. 3.

[The number refers to the inspection number in table.]

No. 2.—Ordered automatic gates for elevator.

No. 8.—Ordered one projecting key removed or covered on a printing press.

No. 20.—A new closet ordered.

No. 21.—Re-ordered automatic gates to elevator openings.

No. 24.—Ordered automatic gates put in good working order.

No. 29.—Ordered automatic gates at elevator openings.

No. 31.—Ordered closet on lower floor put in a better sanitary condition.

No. 32.—Ordered belt of wire machine cased in.

No. 42.—Re-ordered fire escape for south side of building.

No. 44.—Ordered automatic protection gates for three elevators.

No. 47.—Ordered automatic protection for elevators.

No. 54.—Ordered statements placed on file of all children under the age of 16 years.

No. 60.—Ordered belts of planer and sander cased in; and take off padlock on door on upper floor leading to stairway at west end of building.

No. 64.—Ordered lower wheels of two band saws to be cased in.

No. 65.—Ordered closets kept in better sanitary condition.

No. 67.—Ordered elevator moved; handrail on stairs; guard for belt of morticer, and railing along passage to dry house.

No. 71.—Ordered handrails on two stairways.

No. 74.—Ordered railing around stair opening.

No. 77.—Ordered automatic gates for all elevators. This plant soon to move in new building.

No. 83.—Ordered statements placed on file with name and age of all children under 16 years.

No. 84.—Ordered statements placed on file with name and age of all children employed under the age of 16 years, and set screws on mixer guarded.

No. 85.—Guard for fly wheel of press ordered.

No. 101.—Ordered statements placed on file with name and age of children employed under the age of 16 years, and separate closet for females.

No. 104.—Ordered one set screw on mangler covered.

No. 107.—Ordered registers kept of all children employed under the age of 16 years.

No. 115.—Ordered statements placed on file with name and age of all children employed.

No. 116.—Ordered registers kept with name and age of all children under 16 years.

No. 125.—Automatic gates at elevator openings on three floors.

No. 129.—Ordered two set screws on coupling of line shaft guarded.

No. 130.—Automatic gates on two floors at elevator openings ordered.

No. 131.—Shaft enclosed at second story; and automatic gate provided.

No. 139.—Ordered automatic gates at openings on each floor of two elevators.

No. 143.—Re-ordered fire escape for rear of building.

No. 145.—Ordered all obstruction removed to fire escape on fifth floor, all children registered under 16 years of age, and elevator gates repaired.

No. 146.—Ordered guard for crank shaft on engine, and key to fly wheel.

No. 148.—Ordered automatic gate for elevator on first floor, and obstruction removed in stairway between second and third floor.

No. 152.—Ordered fire escape on front of building.

No. 153.—Ordered closets kept separate and properly marked.

No. 155.—Ordered one set screw on press and two on line shaft guarded.

No. 161.—Automatic gate for elevators; one fire escape on south side of building; shifter provided for belt of paper cutter; guards for one set screw and cog gears on two presses.

No. 162.—Automatic gates for elevator; and one fire escape on rear of building .embracing third and fourth row of windows from the north ordered.

No. 176.—Separate closet for females ordered.

No. 178.—Ordered system of dust arrester for buffer and polisher.

No. 186.—Automatic gates for elevator; handrails on two stairways, and guards for two belts and fly wheel in engine room ordered.

No. 188.—Automatic gates ordered at elevator openings.

No. 192.—Ordered blower extended to sanders.

No. 193.—Railing around fly wheel in engine room ordered.

No. 197.—Automatic gates for all openings of south elevator ordered.

No. 198.—Ordered system of exhaust fans for buffing and polishing wheels.

No. 211.—Ordered one boy under 14 years of age discharged.

No. 212.—Automatic gates provided for all elevators.

No. 213.—Ordered automatic gates for elevators.

No. 214.—Ordered handrails on stairway, and guard for fly wheel in engine room.

No. 215.—Ordered blower system for dust creating machinery.

No. 218.—Ordered handrails on all stairs, and railings along galleries around kettles.

No. 221.—Ordered system of dust arresters.

No. 223.—Automatic gates for elevator, and fire escape on east side of factory ordered.

No. 240.—Ordered guard for belts of sander and dovetailer.

No. 241.—Guard for belt of spoke hammer ordered.

No. 246.—System of blowers ordered.

No. 249.—Ordered windows leading to fire escape cased in.

No. 251.—Ordered automatic gates for elevator, and a system of blowers.

No. 260.—Automatic gates at elevator openings, and guards for three belts ordered.

No. 253.—Ordered two sets screws covered.

No. 266.—Ordered main pipe of blower repaired.

No. 268.—Ordered an automatic trap door at elevator on second floor, and repair floor in blacksmith shop.

No. 269.—Automatic gates at elevator opening ordered.

No. 271.—Ordered system of blowers for buffing and polishing wheels.

No. 279.—Guard for belt of dynamo ordered.

No. 287.—Ordered guards for three belts running through floor.

No. 288.—Ordered stair opening guarded on second floor.

No. 294.—Ordered belts of saw and planer guarded.

No. 297.—Ordered automatic gates for elevator.

No. 305.—Ordered set screws on feather renovator covered.

No. 310.—Ordered automatic trap doors at elevator openings, and system of blowers for buffing and polishing wheels.

No. 311.—System of blowers for buffers and polishers ordered.

No. 318.—Ordered guard for stair opening on third floor.

No. 319.—Guards for two belts on second floor ordered.

No. 323.—Ordered handrail on stairs, and railing around opening.

No. 324.—Ordered gates made to open and close automatically.

No. 331.—Ordered one boy under 14 years of age discharged.

No. 332.—Ordered guard for one belt and remove obstructions to fire escape.

No. 336.—Handrail on two stairways ordered.

No. 342.—Ordered guards for cog gearings, and two belts.

No. 345.—Guard for one belt on second floor ordered.

No. 349.—Handrail on stairways ordered.

No. 352.—Ordered handrails on all stairs, and guard for fly wheel in engine room.

No. 353.—Handrail on stairs, guards for cut off saw, main belt, and one set screw on line shaft ordered.

No. 357.—Ordered guards for cog gearings on bolting chests.

No. 361.—Ordered guards for exposed part of fly wheel in engine room.

No. 362.—Handrails on stairs; automatic gates for elevator, and blower system for grinding room ordered.

No. 363.—Ordered statements placed on file with name and age of all children employed under 16 years; guard for fly wheel in engine room, and better blower system for sander wheels.

No. 365.—Handrails on stairs, and guards for three belts running through floor ordered.

No. 370.—Ordered guards for three belts on second floor.

No. 378.—Ordered a system of blowers.

No. 384.—Ordered three belts on second floor guarded.

No. 385.—Ordered floor opening of pumps guarded; recommended a gate provided for railing around dynamos, and a warning notice on gate.

No. 387.—Ordered statements placed on file with name and ages of all children employed under 16 years; stairs screened, and guard for one belt.

No. 391.—Ordered two bandsaws guarded and connected with blowers.

No. 392.—Re-ordered system of blowers.

No. 397.—Ordered handrails on stairs, and guard for belt of ironer.

No. 398.—Separate closets for females ordered.

No. 401.—Ordered registers kept of all children employed under the age of 16 years; automatic gates at elevator openings, and guard for cog gearings of veneer cutter.

No. 402.—Handrail on stairs in engine room ordered.

No. 404.—Automatic gates for second floor of elevator ordered.

No. 409.—Ordered railing and handrail on stairs in boiler room.

No. 416.—Ordered statements placed on file of all children employed under the age of 16 years. Also ordered two set screws covered, and hand rail on rear stairway.

No. 419.—Ordered better sanitary condition of closets.

No. 420.—Ordered proper closets provided for employés.

No. 425.—Ordered registers kept of all children employed under the age of 16 years.

No. 426.—Ordered statements placed on file with name and age of all children employed under the age of 16 years; elevator gates locked; shifters provided on several machines, and a number of set screws covered.

No. 429.—Ordered better sanitary condition of closet.

No. 440.—Ordered two elevator gates put in running order; fire escape at end of main building; handrail on one stairway, and blower system for emery wheels in grinding room.

No. 445.—Better sanitary condition for closets ordered.

No. 449.—Ordered closets kept in better sanitary condition.

No. 450.—Repair engine bed, and back guard for cut off saw ordered.

No. 453.—Guard for belt of sticker, and shifter for same ordered.

No. 455.—Ordered one set screw covered on counter shaft of saw.

No. 456.—Ordered closet kept in a better sanitary condition.

No. 459.—Hand rail on one stairway, and better sanitary condition of closets ordered.

No. 463.—Ordered railing around fly wheel in engine room.

No. 475.—Guard for band saw ordered.

No. 476.—Ordered guards for two belts, and two set screws.

No. 478.—Statements placed on file with name and ages of all children employed under 16 years; and guards for friction pulleys, and belt of gummers ordered.

No. 480.—Ordered better sanitary condition of closets.

No. 481.—Ordered loose pulleys and shifters on cut off, and rip saw and saw guard or splitter for rip saw.

No. 483.—Guard for trimmer saw ordered.

No. 484.—Ordered handrail on stairs in boiler shop.

No. 485.—Ordered railing around fly wheel in engine room.

No. 486.—Ordered statements placed on file with name and ages of children employed under 16 years; guards for belts of veneer cutter, loose pulleys, and shifters for two machines.

No. 488.—Guards for belts of band saw, cut off saw, and sticker on second floor ordered.

No. 489.—Ordered hand rail on one stairway, and guards for belts of buzz planer.

No. 490.—Repair and put handrail on one stairway.

No. 491.—Automatic gates for one elevator ordered.

No. 496.—Ordered guards for belt at head of stairway; cog gearings on bolting chests, and set screws on grind stone.

No. 499.—Ordered loose pulleys, shifters, and saw guard for rip saw.

No. 510.—Ordered statements placed on file with name and ages of all children employed under 16 years.

No. 514.—Ordered one boy under 14 years of age discharged; handrail on one stairway; automatic trap door for elevator; guards for belts of cutter, belts and pulleys on second floor, and several set screws.

No. 516.—Ordered statements placed on file with name and age of all children employed under 16 years; other stair protection, and guards for belts running through to second floor.

No. 519.—Ordered registers kept of all children employed under 16 years of age.

No. 538.—Guards for belts running through second floor.

No. 543.—Ordered automatic trap door for elevator opening, and hand rail for one stairway.

No. 544.—Ordered main belt in lower part of mill guarded.

No. 545.—Ordered four boys under 14 years of age discharged.

No. 550.—Ordered fire escape at north end of factory.

No. 551.—Ordered guards for fly wheel, main pulley, belt, and cog gearings on board mills.

No. 555.—Ordered guards for belts of rip saws, and put closets in good condition.

No. 556.—Ordered railing around fly wheel, and repair closets.

No. 570.—Ordered one boy under 14 years of age discharged; handrail on one stairway, and hanging guards for trimmer saws.

No. 574.—Ordered five boys under 14 years of age discharged; statements placed on file with name and age of all children employed under 16 years, and guards for two belts running through floor.

No. 590.—Rear guard for bolting saw ordered.

No. 596.—Ordered one boy under 14 years of age discharged; registers kept of all children employed under 16 years of age; guards for three belts, one pulley, and one set screw.

No. 598.—Guard for pulley running carrier of drag saw ordered.

No. 602.—Back guard for bolting saw ordered.

No. 605—Ordered one set screw on saw arbor covered or removed.

No. 609.—Ordered handrail on rear stairway, and guard for bull wheel.

No. 627.—Ordered railing around opening of basement stairs, and guard for belt running through floor.

No. 637.—Ordered statements placed on file of all children employed under the age of 16 years.

No. 641.—Ordered stairs to draughting room provided with handrail.

No. 645.—Ordered two boys under 14 years of age discharged, and statements placed on file with name and age of all children employed under 16 years.

No. 649.—Ordered proper closets provided.

No. 651.—Ordered two boys under 14 years of age discharged.

No. 654.—Ordered elevator shaft enclosed; automatic gates provided at openings, and hand rails on stairway.

No. 655.—Ordered hanging guard for trimmer saws, and guard for one set screw on stave saw.

No. 656.—Ordered one boy under 14 years of age discharged, and handrail on stairs in salt block.

No. 661.—Handrail for stairs ordered.

No. 662.—Ordered better gates at elevator openings, and guards for two belts.

No. 664.—Ordered a suitable closet provided.

No. 667.—Ordered statements placed on file with age and name of all children employed under 16 years of age, and guard for one belt.

No. 671.—Ordered one boy under 14 years of age discharged; statements placed on filed with name and age of children employed under 16 years, and railings around all dangerous places in salt block.

No. 676.—Ordered railings at stair openings on two floors.

No. 679.—Ordered handrail on rear stairway, and guards for belts of five machines.

No. 681.—Ordered automatic protection for one floor of elevator.

No. 684.—Ordered handrails, and other stair protection.

No. 690.—Ordered handrails and other stair protection, and guards for three belts running through floor.

No. 697.—Ordered one set screw on sander covered.

No. 698.—Ordered statements placed on file with name and age of all children employed under 16 years, and set screws on two machines covered.

No. 709.—Ordered splitter on rip saw, and railing around fly wheel.

No. 712.—Ordered handrail on one stairway, and connect sander wheels with blowers.

No. 716.—Ordered handrail on stairway.

No. 722.—Ordered handrail and other stair protection.

No. 725.—Handrail on one stairway ordered.

ACCIDENTS REPORTED DURING YEAR.

DISTRICT NO. 3.

[The number refers to inspection number in table.]

No. 31.—Dec. 9, 1896. Charles Teevin, age 27, single, helper, in the employ of A. Leitelt Iron Works, Grand Rapids, fell from scaffold and broke two ribs. Was disabled two weeks, received wages in full, and doctor's bill paid by firm.

No. 38.—Oct. 21, 1896. Martin Hage, age 35, married, working on a rip saw, employed by the New England Furniture Co., at Grand Rapids, received a deep cut in the fleshy part of the thumb by the machinery starting before saw was adjusted, could not have been guarded against. Was disabled three weeks and received wages during that time.

No. 48.—Nov. 6, 1895. D. Vander Wall, age 25, single, sawyer, in the employ of Royal Furniture Co., Grand Rapids, hand cut and thumb badly cut on rip saw. Was disabled six days, and did not receive wages while disabled.

No. 61.—Dec. 2, 1895. D. F. McDonald, age 48, married, employed on buzz planer, by Oriel Cabinet Co., Grand Rapids, lost one finger and two others badly injured. Was disabled eight weeks, received wages during time disabled, and also benefit from a society. It was claimed the machine was imperfect, but inspector could not detect it.

No. 61.—July 1, 1896. George W. Lale, age 24, married, employed by the Oriel Cabinet Co., working as a finisher, had part of one finger cut off by being employed on a machine he was unacquainted with; was disabled four weeks and received no pay or benefit during that time. The accident could not have been guarded against.

No. 61.—Aug. 7, 1896. Thomas Downs, age 22, single, employed on rip saw by Oriel Cabinet Co., Grand Rapids, lost thumb on right hand; it was done so quickly he did not discover it until some one called his attention to it on the floor. Was disabled one week and did not receive wages during time disabled.

No. 61.—Sept. 7, 1896. John Tean, age 45, married, employed at shaper by Oriel Cabinet Co., Grand Rapids, lost parts of three fingers on right hand. Not yet at work; received no wages during time disabled. The accident could have been prevented if the guard had been put on that was furnished for the purpose.

No. 64.—Jan. 16, 1896. Peter Hantman, single, sawyer, in the employ of Waddle Mfg. Co., Grand Rapids, cut in forearm, by sleeve getting caught in saw. Was disabled three weeks, and received wages while disabled, and firm paid doctor's bill.

No. 467.—May 20, 1896. William Dannhaller, age 24, married, moulder, in the employ of Enterprise Foundry Co., Muskegon Heights, was badly burned on foot by hot metal. Not able to be at work yet. Does not receive wages while disabled. Could not have been guarded against.

No. 468.—April 21, 1896. Albert Wachsmath, age 32, married, machinist, in the employ of Shaw Electric Crane Co., Muskegon Heights, lost one eye by a piece of steel flying in his eye while he was hammering. Not yet at work. The accident could not have been guarded against.

No. 471.—April 24, 1896. Peter Jacobson, age 38, married, machine hand, in the employ of Kelley Bros.' Mfg. Co., Muskegon Heights, lost parts of thumb and finger; hand slipped from stock on to the planer. Was disabled four weeks and received one-half wages and doctor's bill paid. Could not have guarded against the accident.

No. 486.—June 2, 1896. R. A. Stekettee, age 30, married, bookkeeper, in the employ of Shelby Basket Co., Shelby, badly cut across the back of hand by the accidental slipping of the cutter. Was disabled two weeks; did not receive wages while disabled. Could not have been guarded against.

No. 491.—April 4, 1896. John Exworthy, age 50, married, machine hand, employed by Pentwater Bedstead Co., Pentwater, stock flew back from planer and lacerated one finger; blood poison set in and he was disabled two months. He received a subscription. It could not have been guarded against.

No. 555.—June 20, 1896. W. B. Cole, age 35, single, employed on edger, by J. H. & J. A. Haak, Haakville, board flew back and broke one rib and severely shocked him. Was disabled two weeks, and was taken care of by the firm during sickness. The accident could not have been guarded against.

No. 560.—May 8, 1896. Fred Gaynor, age 30, single, machine feeder, employed by Haynes Bros'., Cadillac, had parts of four fingers cut off. Was cleaning machine while in motion. Was disabled three months and did not receive wages while disabled.

No. 570.—Dec. 14, 1896. John Lapave, age 21, married, employed by Cummer & Diggins' mill No. 1, Cadillac, was killed by getting knocked down by log carriage and carried by chain on to saw. Burial expenses paid by firm.

No. 574.—Aug. 13, 1896. M. Bryett, age 27, single, employed by C. M. Oviatt Mfg. Co., Cadillac, in the basket factory; hand caught in machinery, and lost parts of two fingers. The machine could not be well guarded at this point.

No. 567.—Jan., 1896. Mrs. Zimmerman, age 45, married, employed as ironer by Cadillac Steam Laundry, Cadillac, had arm crushed to elbow by being careless. Cannot use it yet. Receiving wages while disabled. The accident could not have been guarded against.

No. 585.—March, 1896. Edward Axford, age 22, single, employed around vats, by Southern Chemical Co., Yuma, walked into vat of boiling liquor and had feet badly scalded. Was disabled two weeks. Doctor's bill paid by firm. Could not have guarded against the accident.

No. 594.—June 3, 1896. Charles Anderson, age 30, single, employed as greaser, by Empire Lumber Co., Empire, was caught in machinery; had arm broken and otherwise bruised. Caused by his own carelessness. He was disabled three months, and did not receive wages during time disabled.

No. 615.—April, 1896. Aug. Gerndt, age 33, single, employed as log deck hand, by Henry Starke Land & Lumber Co., Arcadia, caught foot in chain and was cut. Was disabled two weeks, and received no wages during time disabled.

No. 648.—Feb. 21, 1896. Fred Triptow, age 55, married, employed as grinder, by Buckley & Douglas Lumber Co., Manistee, was killed in trying to throw off belt and was caught on shaft. It was caused by his own carelessness. The accident could not have been guarded against.

No. 696.—Aug. 31, 1896. Theo. T. McGrath, age 50, married, machinist, in the employ of the D. L. & N. R. R. shops, Ionia, had hand lacerated by gears, through carelessness. Was disabled eight days. Expenses paid by shop and aid society. Could not have been guarded against.

No. 696.—Feb. 7, 1896. E. H. Nye aged 19, single, boilermaker, employed in D. L. & N. R. R. shops, Ionia, lost an eye by a piece of set screw breaking off and striking it. Was disabled six weeks, and received benefit by subscription aid society. Could not have been prevented by guards.

No. 707.—May, 1896. S. Haskins, age 28, married, machine hand, employed by Cool & Curtis, Freeport, cut off parts of four fingers, in trying to hold down a piece of board back of saw. It was not a safe thing to do but a good saw guard would have prevented the accident. He was disabled three months, and did not receive wages during time disabled.

No. 713.—Sept. 2, 1896. Clarence Ward, age 22, single, machine hand, in the employ of Portland Mfg. Co., Portland, was cleaning dust spout while saw was in motion, and cut off part of one finger and lacerated three others. Was disabled seven weeks, and did not receive wages during time disabled.

No. 719.—Feb., 1896. Emmet Searing, age 22, single, machine hand, employed by Beach Mfg. Co., Lyons, was badly cut on arm, in carelessly taking something away from under saw. Was disabled four weeks, and received no wages during time disabled. The accident could not have been guarded against.

No. 719.—April, 1896. John A. Taylor, age 20, single, machine hand, employed by Beach Mfg. Co., Lyons, cut off part of index finger, and cut two others badly. Was disabled four weeks, and did not receive wages during time disabled. The accident could not have been guarded against.

FOURTH DISTRICT.

O. O. KRAPF, *Deputy Inspector.*

SUMMARY OF WORK IN FOURTH INSPECTION DISTRICT.

OFFICE OF DEPUTY INSPECTOR,
Saginaw, Dec. 9, 1896.

HON. C. H. MORSE, *Commissioner of Labor, Lansing, Mich.:*

DEAR SIR:—In obedience to instructions contained in circular issued by you Nov. 30, 1895, I most respectfully submit the following report of my work as Deputy Factory Inspector since I commenced the work Sept. 19, 1893, up to Dec. 5, 1896.

Kind of changes ordered.	1893. No. of changes ordered.	1893. No. of orders complied with.	1894. No. of changes ordered.	1894. No. of orders complied with	1895. No. of changes ordered.	1895. No. of orders complied with.	1896. †No. of changes ordered.	1896. No. of orders complied with.
Fire escapes	15	3	12	10	9	9	*4	3
Automatic guards for elevators	11	7	22	11	18	14	*7	4
Separate closets where both sexes are employed	4	2	9	9	9	6	8	6
Doors changed to swing outward	6	2	10	9	6	6	*3	3
Belts guarded	23	15	15	13	23	14	16	14
Wheels and pulleys guarded	8	4	17	13	22	14	8	6
Hand rails on stairways	87	31	69	49	75	55	27	20
Projecting set-screws and keys guarded	10	3	7	5	22	12	14	9
Exhaust fans to remove dust	3	1	11	4	13	6	*4	3
Children under 14 years discharged	42	42	14	14	20	20	*28	25
Loose pulleys and shifters	......	......	......	......	......	......	26	16
New closets where none were	......	......	......	......	......	......	2	2
Old closets cleaned and repaired	......	......	......	......	......	......	4	4
Miscellaneous orders	25	14	96	47	80	45	60	41
Total changes and compliances	234	124	282	184	297	201	211	157

*Some of these orders were made before the regular inspection.
†Two or more changes of the same kind were ordered in many of the factories in this district.

Whole number of factories inspected in 1893.................. 239
Whole number of factories revisited in 1893.................. 79
Whole number of factories inspected in 1894.................. 421

Whole number of factories revisited in 1894	122
Whole number of factories inspected in 1895	418
Whole number of factories revisited in 1895	191
Whole number of factories inspected in 1896	396
Whole number of factories revisited in 1896	134
Whole number of inspections since 1893	1,474
Whole number of revisits since 1893	506

The compliances reported are only those which I have actual knowledge of and know have been provided and I have good reason to believe that several orders have been complied with where I have not as yet revisited this year. I have been over most of my territory or district twice this year, and I find that the number of factories in this district has decreased in the last two years, especially in the following lines of manufacture: Lumber, salt, staves, heading, hoops. Quite a number have been burned and not rebuilt, while others have been moved away to northern Minnesota and Wisconsin, and some have been removed to Canada. The statistics gathered in the district will show an enormous decrease in manufactures, as compared with other years. This has caused the majority of manufacturers to be in rather close or straightened financial circumstances, and probably more orders would have been issued if factories were running to their fullest capacity, for it seems a hardship sometimes to put them to great expense when, perhaps, their factory is only running part of the time, and then with a greatly reduced force of employés, for sometimes the law requires changes which are expensive; for instance, I found it necessary in the last year to order one concern to provide a dust collector system in their factory. The system was purchased and put in at a cost of about $2,200. When it was in they found that their engine was too small to drive it, and a larger engine necessitated a new boiler, and this another boiler and engine house, so when they were again in running order the dust collector system had entailed a cost of about $6,000 (no small item in these times).

I have obeyed your instructions in regard to the cleanliness and sanitary conditions found in the bake shops in my district, and I can say that generally they are in fair condition, but I found one which I ordered cleaned up, and kept clean. I am of the opinion that this bakery had not been cleaned in the four years it had been operated. Filth was on the floor some places over two inches deep. Cobwebs hung from the ceiling and walls; the windows were so dirty that it was next to impossible for light to penetrate them. Machinery and everything about the place was in a dirty condition. Some of the other bake shops I visited were none too clean, and I think that a law should be enacted to control such conditions in this line of manufacture.

I have met with very little opposition in the enforcement of the law, and am glad to say that most manufacturers think the law is a good and just one, and I have been well treated by most of them.

I am of the opinion that the work of factory inspection has resulted in much good, both to the employer and employé, and it will continue to produce good results so long as carried on by men of discretion, judgment and experience. I know of quite a number of instances where changes have been ordered and orders complied with that were the means of saving life and health, therefore happiness.

Very respectfully,
O. O. Krapf.

Inspection book No. 1. **TABLE No. 4.—**

No. given factory for 1898.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
1	Jan. 21	Saginaw, E. S.	McClellan File Co.	Files and rasps	run.	full
2	" 21	"	Allington & Curtiss Mfg. Co.	Dust collectors	"	"
3	" 21	"	Randall & Boyd	Dressed lumber	"	part
4	" 27	"	Fischer Bros.	Bicycles	"	full
5	" 27	"	Saginaw Printing & Pub. Co.	Printed matter	"	"
6	" 27	"	Robertson's Valley Laundry	Laundry work	"	"
7	" 27	"	William Callam & Son	Flour, feed, etc.	"	"
8	" 28	"	U. S. Baking Co.	Crackers, cakes, etc.	"	"
9	" 28	"	Bastian Bros. & Co.	Printed matter	"	"
10	" 28	"	Crystal Laundry	Laundry work	"	"
11	Feb. 3	"	Dederich Bottling Works	Beer & carbonated bev.	"	"
12	" 3	"	Marks Cigar Factory	Cigars	"	"
13	" 3	"	Raquets Brewery	Beer	"	"
14	" 3	"	Roberts' Cigar Factory	Cigars	"	"
15	" 11	"	Hemmeter Cigar Co.	"	"	"
16	" 11	"	John Deibel, Jr.	"	"	"
17	" 12	Saginaw, W. S.	Jackson & Church	Machinery	"	part
18	" 12	"	McGregor & Jackson	Boilers, etc.	"	"
19	" 12	"	John G. Schemm	Beer & carbonated bev.	"	full
20	" 12	"	McLeod Bros.	Cigar boxes	"	"
21	" 13	Saginaw, E.S.	Michigan Saw Works	Saws	"	part
22	" 13	"	Koehler Bros.	Fire escapes, etc.	"	"
23	" 13	"	A. F. Bartlett & Co.	Machinery and castings	"	full
24	" 13	"	Bartlett Illuminating Co.	Electric light and power	"	"
25	" 14	Saginaw, W.S.	Princess Manufacturing Co.	Wrappers & shirt waists	"	"
26	" 15	Saginaw, E.S.	Mitts & Merrill	Machinery and castings	"	"
27	" 15	"	Hoerner & Heineman	Castings	idle	......
28	Apr. 23	"	Wm. Williamson	Machinery and forgings	run.	full
29	" 23	"	Michigan Lumber Co.	Lumber and wood	"	"
30	" 23	"	Michigan Lumber Co.	Furniture stock	"	"
31	" 23	"	Acme Plaining Mill & Box Fac'y	Dressed lumber & boxes	"	"
32	" 23	"	Gebhart & Estabrook	Lumber, lath and salt	idle	......
33	" 30	Alpena	C. W. Edwards	Cigars	run.	full
34	" 30	"	J. Levyn	"	"	"
35	" 30	"	Mark Horwitz	"	"	"
36	" 30	"	W. L. & H. D. Churchill	Lumber and lath	"	"
37	" 30	"	Evening Echo	Printed matter	"	"
38	" 30	"	Beck Brewing Co.	Beer	"	"
39	" 30	"	Ellis Steam Laundry	Laundry work	"	"
40	" 30	"	Comstock Bros.	Lumber	idle	......
41	May 1	"	W. H. Cockley	Staves	"	......
42	" 1	"	H. D. Cleveland	Hoops	run.	full
43	" 1	"	Alpena Spool Co.	Spools	"	"
44	" 5	Wolverine	P. E. Hacket	Lumber	idle	......
45	" 5	"	Guelph Patent Cask Co.	Veneer	run.	full
46	" 6	Vanderbilt	Chas. Zeckgraff	Lumber	"	"
47	" 6	"	M. D. Olds	Staves	"	"
48	" 7	Cheboygan	Cheboygan Manufacturing Co.	Sash and doors	"	"
49	" 7	"	Shellhorn & Rich	Machinery & castings	"	"
50	" 7	"	Steam Laundry	Laundry work	"	"

District No. 4. *O. O. Krapf, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water-closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	*	55	53	2	$2,000	----	----	------	10	45	----	----	yes	yes	no	†	yes	yes	----	yes	yes	----	1
60	60	45	40	----	1,800	----	----	------	10	60	----	----	----	"	"	†	"	no	----	"	----	----	2
60	54	50	41	----	1,250	----	----	------	10	60	----	----	----	"	"	†	"	yes	yes	"	----	----	3
60	60	10	6	----	160	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	----	----	4
60	60	18	7	1	500	----	1	yes	10	60	----	----	yes	"	"	†	"	"	----	"	----	----	5
60	60	16	4	12	680	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	----	----	6
60	‡	6	6	----	325	----	----	------	10	60	----	----	yes	"	"	†	"	no	----	"	----	----	7
60	60	9	9	----	360	----	----	------	10	60	yes	yes	"	"	"	†	"	yes	----	"	yes	----	8
60	60	6	4	----	225	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	----	----	9
60	60	9	4	5	200	----	----	------	10	60	----	----	yes	"	"	†	"	"	----	"	yes	----	10
54	54	6	1	3	100	----	----	------	9	60	----	----	----	"	"	†	"	"	----	"	"	----	11
48	48	8	4	----	175	----	----	------	8	60	----	----	----	"	"	†	----	----	----	"	----	----	12
60	60	6	6	----	240	----	----	------	10	60	----	----	yes	"	"	†	yes	yes	----	"	----	----	13
48	48	17	15	2	625	----	1	yes	8	60	----	----	"	"	"	†	----	----	----	"	yes	----	14
48	48	74	54	20	2,625	----	----	------	8	60	yes	yes	"	"	"	†	----	----	----	"	"	----	15
48	48	4	4	----	160	----	----	------	8	60	----	----	----	"	"	†	----	----	----	"	----	----	16
60	54	33	27	1	1,250	2	----	------	10	60	----	----	yes	"	"	†	yes	yes	----	"	yes	----	17
60	54	30	18	----	800	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	----	----	18
60	60	10	8	----	500	----	----	------	10	60	----	----	yes	"	"	†	"	"	----	"	----	----	19
60	60	8	2	3	150	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	yes	----	20
60	54	25	13	----	600	----	----	------	10	60	----	----	yes	"	"	†	"	"	----	"	----	----	21
60	48	15	6	----	235	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	----	----	22
60	60	100	64	----	2,300	----	----	------	10	60	yes	yes	yes	"	"	†	"	"	----	"	----	----	23
60	60	5	3	----	160	----	----	------	10	60	----	----	"	"	"	†	"	"	----	"	----	----	24
60	60	102	10	92	1,150	1	----	------	10	60	----	----	"	"	"	†	"	"	----	"	yes	----	25
60	60	37	37	----	1,300	----	----	------	10	60	----	----	"	"	"	†	"	"	----	"	----	----	26
60	..	5	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	27
60	60	20	6	----	800	----	----	------	10	60	----	----	yes	yes	no	†	yes	yes	----	yes	----	----	28
60	60	22	22	----	1,400	----	----	------	10	60	----	----	"	"	"	†	"	"	----	"	----	----	29
60	60	11	11	----	400	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	----	----	30
60	60	35	19	----	500	----	----	------	10	60	----	----	no	"	"	†	"	"	yes	"	----	----	31
60	..	110	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	32
48	48	4	4	----	210	----	----	------	8	60	----	----	----	yes	no	†	----	----	----	yes	----	----	33
48	48	12	6	----	240	----	1	yes	8	60	----	----	yes	"	"	†	----	----	----	"	----	----	34
60	60	10	7	----	250	----	3	"	10	60	----	----	----	"	"	†	----	----	----	"	----	----	35
60	60	100	100	----	4,000	----	----	------	10	60	----	----	yes	"	"	†	yes	yes	----	"	----	----	36
60	60	14	12	2	550	----	----	------	10	60	----	----	"	"	"	†	"	"	----	"	yes	----	37
60	60	12	9	----	425	----	----	------	10	60	----	----	"	"	"	†	"	"	----	"	----	----	38
60	60	10	4	2	200	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	yes	----	39
60	--	60	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	40
60	..	25	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	41
60	60	14	12	----	400	----	----	------	10	60	----	----	----	yes	no	†	yes	yes	----	yes	----	----	42
60	60	70	32	----	1,100	----	----	------	10	60	----	no	yes	"	"	†	"	no	no	"	----	----	43
60	..	25	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	44
60	60	120	80	----	2,650	----	----	------	10	60	----	----	----	yes	no	†	yes	yes	----	yes	----	----	45
60	60	15	15	----	460	----	----	------	10	60	----	----	yes	"	"	†	----	"	yes	"	----	----	46
60	60	26	26	----	1,150	----	----	------	10	60	----	----	----	"	"	†	yes	----	"	"	----	----	47
60	60	15	15	----	700	----	----	------	10	60	----	----	yes	"	"	†	"	yes	"	"	----	----	48
60	60	12	8	----	360	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	----	----	49
60	60	10	4	2	140	----	----	------	10	60	----	----	----	"	"	†	"	"	----	"	yes	----	50

* 78 hours-running overtime.
‡ 66 hours-running overtime.

† None required.

Inspection book No. 2.

TABLE No. 4.—Continued.—

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
51	May	7	Cheboygan	Murphy & Noll	Cigars	run.	full
52	"	11	Saginaw, E. S.	O'Donnell, Spencer & Co.	Sash, doors, etc.	"	"
53	"	11	"	Feige Desk Co.	Office desks	idle	......
54	"	12	W. Bay City	Salzburg Brewery	Beer	run.	full
55	"	12	Salzburg	Theodore Hine	Lumber	"	"
56	"	13	W. Bay City	H. E. Carpenter, Jr.	Lumber, lath and salt	"	"
57	"	13	"	West Bay City Brewery	Beer	"	"
58	"	13	Salzburg	W. D. Young & Co.	Hardwood flooring	"	"
59	"	19	Saginaw, W.S.	Thomas Jackson & Co.	Sash, doors and boxes	"	"
60	"	19	"	Saginaw Furniture Co.	Furniture	"	"
61	"	19	"	Saginaw Box Co.	Woodenware	"	"
62	"	19	"	Crum-Carter Co.	Wooden dishes	"	"
63	"	20	"	Saginaw Basket Works	Baskets	"	"
64	"	20	"	Keystone Shade Rollers	Shade rollers	"	"
65	"	20	"	Ferrell, Prame & Ozier	Seed cleaners	"	"
66	"	21	Salzburg	Standard Hoop Co.	Hoops	"	"
67	"	21	"	Russell Bros. & Co.	Box shooks	"	"
68	"	21	Brooks	Green & Brahman	Lumber and lath	idle	......
69	"	21	"	Kern Manufacturing Co.	Lumber, lath and salt	"	......
70	"	22	Saginaw, W.S.	D. Hardin & Co.	Sash, doors, etc.	run.	full
71	"	22	"	Stenglein Manufacturing Co.	Furniture	"	"
72	"	22	"	American Potato Flour Co.	Potato flour and chips	"	"
73	"	23	"	Brand & Hardin	Flour, feed, etc.	"	"
74	"	22	"	Brand & Hardin	Shingles and salt	idle	......
75	"	23	"	Wolverine Cigar Co.	Cigars	run.	full
76	June	8	"	A. W. Wright Lumber Co.	Dressed lumber	"	"
77	"	8	"	A. W. Wright Lumber Co.	Lumber, lath and salt	"	"
78	"	8	"	Henry Passolt	Soap.	"	"
79	"	8	Saginaw, E.S.	Edward Germain	Sash, doors, etc.	"	"
80	"	10	Saginaw, W.S.	Saginaw Evening Leader	Newspaper	"	"
81	"	10	"	Smith & Stoelker	Printed matter	"	"
82	"	10	"	Saginaw Steam Laundry	Laundry work	"	"
83	"	11	Saginaw, E.S.	Witter's Laundry	" "	"	"
84	"	11	"	R. Gottschalk	Cigars	"	"
85	"	11	"	National Brewery	Beer	"	"
86	"	11	Saginaw, W.S.	City Milling Co.	Flour, feed, etc.	idle	......
87	"	11	"	Mag. Spr'ng and Cold Storage Co.	Carbonated beverages	run.	full
88	"	12	Saginaw, E.S.	Geo. W. Emendorfer	Bicycles	"	"
89	"	12	"	Saginaw Cycle and Model Works	Bicycles and models	"	"
90	"	12	"	O. M. Pausch	Etchings	"	"
91	"	12	"	H. & W. Heim.	Extracts, etc.	"	"
92	"	12	"	W. L. Marr	Bicycles	"	"
93	"	13	Saginaw, W.S.	Barrow's Music Co.	Banjos, guitars & mand.	"	"
94	"	13	"	Saginaw Elec. L't and Power Co.	Electric light	"	"
95	"	15	Port Huron	Schulte & Watson	Printed matter	"	"
96	"	15	"	C. E. Mudford	Cigars	"	"
97	"	15	"	Pt. Huron Eng. & Thresher W'ks	Engines and threshers	"	"
98	"	16	"	D. L. Ballentine	Print. mat. & engravings	"	"
99	"	16	"	Phoenix Iron Works	Machinery and boilers	"	"
100	"	16	"	R. M. Campbell	Sash, doors, etc.	"	"

District No. 4. *O. O. Krapf, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
48	48	6	4	----	$150	----	----	----	8	60	----	----	----	yes	no	*	----	----	----	yes	----	----	51
60	60	200	140	----	3,800	----	15	yes	10	45	yes	yes	yes	"	"	*	yes	yes	yes	"	----	----	52
60	..	150	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	53
60	60	10	10	----	600	----	----	----	10	60	----	----	yes	yes	no	*	yes	yes	----	yes	----	----	54
60	60	42	42	----	1,450	----	----	----	10	60	----	----	"	"	"	*	"	no	----	"	----	----	55
60	60	120	120	----	2,900	----	6	yes	10	60	----	----	"	"	"	*	"	yes	----	"	----	----	56
60	60	9	9	----	560	----	----	----	10	60	----	----	"	"	"	*	"	"	----	"	----	----	57
60	60	25	25	----	950	----	1	yes	10	30	----	----	"	"	"	*	no	no	yes	"	----	----	58
60	60	100	55	----	1,680	----	----	----	10	60	yes	yes	yes	"	"	*	yes	yes	"	"	----	----	59
60	60	120	75	----	2,000	----	1	yes	10	45	"	"	no	"	"	*	"	no	"	"	----	----	60
60	60	60	53	7	1,500	----	----	----	10	45	----	----	yes	"	"	*	"	yes	"	"	yes	1	61
60	60	130	92	38	4,200	6	7	yes	10	45	yes	yes	"	"	"	*	"	"	----	"	"	----	62
60	60	150	107	----	2,000	----	4	"	10	60	----	----	----	"	"	*	"	"	yes	"	----	1	63
60	60	45	32	13	850	----	----	----	10	45	yes	yes	yes	"	"	*	"	"	"	"	yes	----	64
60	60	10	5	----	220	----	----	----	10	60	----	----	"	"	"	*	"	"	"	"	----	----	65
60	60	60	45	----	1,650	----	----	----	10	60	----	----	"	"	"	*	"	"	----	"	----	----	66
60	60	80	40	----	1,600	----	6	yes	10	60	----	----	"	"	"	*	"	no	yes	"	----	2	67
60	..	50	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	68
60	..	75	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	69
60	60	30	30	----	1,350	----	----	----	10	60	----	----	yes	yes	no	*	yes	yes	yes	yes	----	1	70
60	60	45	40	----	1,500	1	2	yes	10	60	yes	yes	"	"	"	*	"	"	"	"	----	----	71
60	60	25	18	4	775	----	----	----	10	60	----	no	"	"	"	*	"	"	----	"	yes	----	72
60	60	16	16	----	325	----	----	----	10	60	----	----	"	"	"	no	"	"	----	"	----	----	73
60	..	10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	74
48	48	34	28	6	1,530	----	1	yes	8	60	----	----	yes	yes	no	*	----	----	----	yes	yes	----	75
60	60	105	90	----	2,650	----	----	----	10	45	----	----	"	"	"	*	yes	yes	yes	"	----	----	76
60	60	160	142	----	5,200	----	2	yes	10	60	----	----	"	"	"	*	"	"	----	"	----	----	77
60	60	9	9	----	350	----	----	----	10	60	----	yes	"	"	"	*	"	"	----	"	----	----	78
60	60	400	180	----	6,400	----	6	yes	10	60	----	----	"	"	"	*	"	no	yes	"	----	----	79
60	60	11	11	----	400	----	----	----	10	60	----	----	----	"	"	*	----	----	----	"	----	----	80
60	60	5	5	----	160	----	----	----	10	60	----	----	----	"	"	*	yes	yes	----	"	----	----	81
60	60	15	6	9	400	----	----	----	10	60	----	----	yes	"	"	*	"	"	----	"	yes	----	82
60	60	26	7	19	700	----	----	----	10	60	----	----	"	"	"	yes	"	"	----	"	"	----	83
48	48	6	4	----	165	----	1	yes	10	60	----	----	"	"	"	*	----	----	----	"	----	----	84
60	60	8	8	----	400	----	----	----	10	60	----	----	"	"	"	*	yes	yes	----	"	----	----	85
60	..	8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	86
60	60	8	8	----	310	----	----	----	10	60	----	----	yes	yes	no	*	yes	yes	----	yes	----	----	87
60	60	4	4	----	110	----	----	----	10	60	----	----	----	"	"	*	----	----	----	"	----	----	88
60	60	6	4	----	120	----	1	yes	10	60	----	----	----	"	"	*	yes	yes	----	"	----	----	89
60	60	5	4	1	185	----	----	----	10	60	----	----	yes	"	"	*	"	"	----	"	yes	----	90
60	60	4	4	----	200	----	----	----	10	60	----	----	"	"	"	*	"	"	----	"	----	----	91
60	60	10	10	----	500	----	----	----	10	60	----	----	----	"	"	*	"	"	----	"	----	----	92
60	60	7	5	----	275	----	----	----	10	60	----	----	----	"	"	*	"	"	----	"	----	----	93
72	72	8	8	----	450	----	----	----	12	60	----	----	----	"	"	*	"	"	----	"	----	----	94
60	60	5	3	----	180	----	----	----	10	60	----	----	----	"	"	*	"	"	----	"	----	----	95
48	48	18	9	2	455	----	----	----	8	60	----	----	----	"	"	*	----	----	----	"	yes	----	96
60	60	226	198	----	7,550	----	1	yes	10	45	----	yes	yes	"	"	*	yes	no	yes	"	----	----	97
60	60	5	5	----	185	----	----	----	10	60	----	----	----	"	"	*	"	yes	----	"	----	----	98
60	60	75	15	----	600	----	----	----	10	60	----	----	yes	"	"	*	"	"	----	"	----	----	99
60	60	35	8	----	325	----	----	----	10	60	----	yes	"	"	"	*	no	no	yes	"	----	----	100

* None required.

Inspection book No. 3. TABLE No. 4.—Continued.—

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
101	June 16	Port Huron	Riverside Woodworking Co.	Doors, sash, etc.	run.	full
102	" 16	"	F. & P. M. R. R. Shops	R. R. and car repairs	"	part
103	" 16	"	Tunnel City Boiler Works	Boilers	idle	......
104	" 17	"	Howard Planing and Saw Mill	Lumber and lath	run.	full
105	" 17	"	City Steam Laundry	Laundry work	"	"
106	" 17	"	Pt. Huron Granite & Marble W'ks	Stone work	"	"
107	" 17	"	E. C. Williams & Co.	Printed matter	"	"
108	" 17	"	Port Huron News	Newspaper	"	"
109	" 18	Marine City	Davidson & Wansey	Salt	"	"
110	" 18	"	Marine City Stave Co.	Salt and barrels	"	"
111	" 18	"	Marine City Stave Co.	Staves and heading	idle	......
112	" 18	"	M. Sicken	Dressed lumber	run.	full
113	" 18	"	A. Bower	Sash and doors	"	"
114	" 18	"	Mich. Salt Works	Salt	idle	......
115	" 19	St. Clair	C. Sheldon	Leather	run.	full
116	" 19	"	Belknap & Phillips	Brick	"	"
117	" 19	"	Thompson Bros.	Salt	"	"
118	" 19	"	Diamond Crystal Salt Co.	Fine salt	"	"
119	" 19	"	N. & B. Mills	Sash, doors, etc.	"	"
120	" 19	"	C. Sheldon	Brick	idle	......
121	" 20	Port Huron	F. J. Haynes & Co.	Sash, doors, etc.	run.	full
122	" 20	"	F. D. Jenks & Co.	Dressed lumber	idle	......
123	" 20	"	Kern Brewing Co.	Beer	run.	full
124	" 23	Bay City	James McKean	Wire reels	"	"
125	" 23	"	Thomas Munn	Machinery	idle	......
126	" 23	"	H. Goldman	Rags, metal, etc.	"	......
127	" 23	"	Mich. Pipe Co.	Wooden pipe	run.	full
128	" 23	"	National Cycle Co.	Bicycles	"	"
129	" 24	St. Charles	St. Charles Hoop Co.	Hoops	"	"
130	" 24	Chesaning	Stewart, Long & Co.	Staves and heading	"	"
131	" 25	Saginaw, E.S.	Laing Printing House	Printed matter	"	"
132	" 25	"	Seeman & Peters	" "	"	"
133	" 25	"	Wm. Barie	Dress braids	"	"
134	Aug. 25	"	Saginaw Evening News	Newspaper	"	"
135	" 25	"	Saginaw Courier Herald	Printed matter	"	"
136	" 26	"	Saginaw Brewing Co.	Beer	"	"
137	" 26	"	Saginaw Clay Mfg. Co.	Paving brick	"	"
138	" 27	"	Wm. G. Evans	Printed matter	"	"
139	" 27	Midland	Wm. Patrick	Shingles and salt	"	"
140	" 27	"	Brown & Anderson	Lumber	idle	......
141	" 27	"	T. C. Prouty Mfg. Co.	Door hangers	run.	full
142	" 27	"	Midland Chemical Co.	Bromides & disinfect'ts	"	"
143	" 30	Saginaw, W.S.	Palmerton Woodenware Works.	Tubs, pails, etc.	"	"
144	" 30	"	Peerless Hand Laundry	Laundry work	"	"
145	" 30	Saginaw, E.S.	Hoyt Dry Goods Co.	Dresses and cloaks	"	"
146	" 30	"	Saginaw Drygoods & Carpet Co.	Dresses	"	"
147	July 1	Bay City	Smalleys & Woodworth	Lumber and salt	"	"
148	" 1	"	Bay City Cigar Co.	Cigars	"	"
149	" 1	"	Bay City Brewing Co.	Beer	"	"
150	" 1	"	Bay City Electric Light Plant	Electric light	"	"

District No. 4. *O. O. Krapf, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	33	33	----	$1,250	----	----	------	10	60	----	yes	yes	yes	no	¶	no	no	yes	yes	----	1	101
60	48	15	8	----	370	----	----	------	10	60	----	----	----	"	"	¶	yes	yes	----	"	----	---	102
60	..	30	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	103
60	60	40	40	----	1,950	----	----	------	10	60	----	yes	yes	yes	no	¶	yes	yes	yes	yes	----	----	104
60	60	21	4	17	§	----	----	------	10	60	----	----	"	"	"	¶	"	"	----	"	yes	----	105
60	60	12	8	----	500	----	----	------	----	60	----	----	----	"	"	¶	----	----	----	"	----	----	106
57	57	7	5	2	300	----	----	------	9½	60	----	----	----	"	"	¶	yes	yes	----	"	yes	----	107
60	60	10	9	1	480	----	----	------	10	60	----	----	yes	"	"	¶	----	----	----	"	"	----	108
*	*	48	48	----	3,000	----	----	------	10	60	----	----	----	"	"	¶	yes	yes	----	"	----	----	109
60	60	30	20	----	975	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	----	----	110
60	..	100	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	111
60	60	12	12	----	460	----	----	------	10	60	----	----	yes	yes	no	¶	yes	yes	yes	yes	----	----	112
60	60	30	16	----	750	----	----	------	10	60	----	----	"	"	"	¶	"	"	"	"	----	----	113
†	..	23	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	4	114
60	60	9	9	----	825	----	----	------	10	60	----	----	yes	yes	no	¶	yes	yes	----	yes	----	----	115
60	60	20	20	----	550	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	----	----	116
*	*	70	62	8	3,600	----	----	------	10	60	----	----	yes	"	"	¶	"	"	----	"	yes	----	117
*	*	38	26	12	1,579	----	----	------	10	60	yes	yes	"	"	"	¶	"	"	----	"	"	----	118
60	60	12	12	----	475	----	----	------	10	60	----	----	"	"	"	¶	no	no	----	"	----	----	119
60	..	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	120
60	60	4	4	----	125	----	----	------	10	60	----	----	yes	yes	no	¶	yes	no	yes	yes	----	----	121
60	..	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	122
60	60	22	22	----	1,100	----	----	------	10	60	----	----	yes	yes	no	¶	yes	yes	----	yes	----	----	123
60	60	25	15	----	330	----	----	------	10	60	----	----	----	"	"	¶	"	"	yes	"	----	----	124
60	..	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	125
60	..	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	126
60	60	55	45	----	1,700	----	----	------	10	60	----	----	yes	yes	no	¶	yes	yes	----	yes	----	----	127
60	60	90	90	----	3,300	----	----	------	10	60	----	----	"	"	"	¶	"	"	yes	"	----	----	128
60	60	45	45	----	1,500	----	1	yes	10	60	----	----	----	"	"	¶	"	"	"	"	----	----	129
60	60	35	15	----	500	----	3	"	10	60	----	----	----	"	"	¶	"	"	"	"	----	----	130
60	60	6	3	----	120	----	----	------	10	60	----	----	yes	"	"	¶	"	"	----	"	----	----	131
60	60	38	27	7	1,300	----	----	------	10	60	yes	yes	"	"	"	yes	"	"	----	"	yes	----	132
60	60	30	4	12	400	----	----	------	10	60	----	----	"	"	"	¶	"	"	----	"	"	----	133
60	60	30	19	1	900	----	1	yes	10	60	----	----	"	"	"	yes	"	"	----	"	"	----	134
60	60	40	35	1	2,600	----	----	------	10	60	yes	yes	"	"	"	¶	"	"	----	"	----	----	135
60	60	16	16	----	780	----	----	------	10	60	----	----	"	"	"	¶	"	"	----	"	----	----	136
60	60	35	35	----	1,475	----	----	------	10	60	----	----	"	"	"	¶	"	"	----	"	----	----	137
60	60	13	9	----	360	----	----	------	10	60	----	----	"	"	"	yes	"	"	----	"	----	----	138
60	60	30	20	----	480	----	----	------	10	60	----	----	"	"	"	¶	"	"	----	"	----	----	139
60	..	90	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	140
60	60	15	15	----	650	----	----	------	10	60	----	----	----	yes	no	¶	yes	yes	----	yes	----	----	141
*	*	8	8	----	430	----	----	------	10	60	----	----	yes	"	"	¶	"	"	----	"	----	----	142
60	60	250	250	----	6,500	3	6	yes	10	60	yes	yes	"	"	"	¶	"	"	----	"	----	----	143
60	60	8	3	5	190	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	yes	----	144
54	54	20	----	15	440	----	----	------	9	60	----	yes	yes	"	"	¶	----	----	----	"	"	----	145
51	51	15	----	15	470	----	----	------	9	60	----	"	"	"	"	¶	----	----	----	"	"	----	146
‡	‡	84	84	----	3,660	----	----	------	10	60	----	----	"	"	"	¶	yes	yes	----	"	----	1	147
48	48	12	8	4	450	----	----	------	8	60	----	----	"	"	"	¶	----	----	----	"	yes	----	148
60	60	16	16	----	700	----	----	------	10	60	----	----	"	"	"	¶	yes	yes	----	"	----	----	149
60	60	5	5	----	240	----	----	------	10	60	----	----	----	"	"	¶	"	"	----	"	----	----	150

* 144 hours-running day and night. § Refused to say. ¶ None required.
† 144 hours-night and day while running.
‡ 120 hours.

Inspection book No. 4. **TABLE No. 4.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
151	July	7	Tawas City	C. H. Prescott & Son	Lumber	run.	full
152	"	8	"	D. & M. R. R. Shops	Railroad repairs	"	"
153	"	8	East Tawas	T. H. Fox & Co.	Staves and heading	"	"
154	"	8	"	Ottawa Hardwood Co.	Lumber	"	"
155	"	9	Au Sable	H. M. Loud & Sons	Lumber and lath	"	"
156	"	9	"	H. M. Loud & Sons	Lumber and poles	"	"
157	"	9	Oscoda	H. M. Loud & Sons	Wooden wheel rims, etc.	"	"
158	"	9	"	Pack, Woods & Co.	Lumber	"	"
159	"	10	Alpena	J. A. Evans	Shingles	"	"
160	"	10	"	Alpena Excelsior Works	Excelsior	"	"
161	"	10	"	Alpena Woolen Mills	Woolen goods	"	"
162	"	10	"	Robert Thompson	Shingles	"	"
163	"	11	East Tawas	Holland-Emery Lumb'r Co., Mill 2	Lumber, lath and salt	"	"
164	"	11	"	Holland-Emery Lumb'r Co., Mill 1	" and lath	"	"
165	"	23	Saginaw, E.S.	Stone Bros.	Shingles and salt	idle	......
166	"	23	"	Tindle & Jackson	Heading	run.	full
167	"	23	"	J. T. Wylie & Co	Hoops	"	"
168	"	23	"	Arthur Simpson	Dressed lumber & boxes	"	"
169	"	23	"	Saginaw Union St. R'y. Pow'r H'se	Electricity	"	"
170	"	23	"	Saginaw Union St. R'y. Shops	Repairs	"	"
171	"	25	"	Wickes Bros. Boiler Shops	Boilers	"	"
172	"	25	"	Wickes Bros.	Machinery	"	"
173	"	25	"	Stingle Bros.	Meats	"	"
174	"	25	"	A. Hobson & Co.	Stone work	"	"
175	Aug.	8	Bay City	J. R. Hall	Shingles	idle	......
176	"	8	"	Jonathan Boyce & Sons	Lumber, lath and salt	run.	full
177	"	8	"	D. Curvall	Shingles	"	"
178	"	12	"	S. G. M. Gates	Lumber	"	"
179	"	13	"	Phœnix Flouring Mills	Flour, feed, etc.	"	"
180	"	13	"	Bay City Stone Co.	Cut stone	"	"
181	"	13	"	Bay County Electric Co.	Electricity	"	"
182	"	13	"	F. E. Bradley	Lumber and salt	"	"
183	"	13	"	National Boiler Works	Boilers	idle	......
184	"	13	"	McKinnon Manufacturing Co.	Boilers and machinery	run.	part
185	"	14	"	Smalley Bros. & Co.	Machinery	"	"
186	"	14	"	Bay City Industrial Works	"	"	full
187	"	14	"	Wm. Peters	Lumber, lath and salt	idle	......
188	"	14	"	Schweilke Bros.	Cigars	run.	full
189	"	18	W. Bay City	F. W. Wheeler & Co.	Iron and steel vessels	"	"
190	"	19	"	Fred Alder	Cigars	"	"
191	"	19	"	Fred C. Ross	Dressed lumber	idle	......
192	"	19	"	John Welch	Lumber	run.	full
193	"	19	"	West Bay City Shoe Mfg. Co.	Ladies' & child'n's shoes	"	"
194	"	19	"	Ross, Bradley & Co.	Dressed lumber & boxes	"	"
195	"	20	"	Empire Electric Laundry	Laundry work	"	"
196	"	20	"	West Bay City Roller Mills	Flour, feed, etc.	"	"
197	"	20	"	Kircher & Newman	Sash, doors, etc.	"	"
198	"	20	"	Valley Steam Laundry	Laundry work	"	"
199	"	20	"	W. H. Whittemore	Machinery	"	"
200	"	20	Bay City	Marine Boiler Works	Boilers	idle	......

District No. 4. ***O. O. Krapf, Deputy Inspector.***

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under sixteen years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No of accidents since last inspection.	No. given factory for 1896.
60	60	52	52	----	$1,825	----	----	------	10	60	----	----	yes	yes	no	§	yes	yes	----	yes	----	----	151
60	60	45	38	----	1,800	----	----	------	10	60	----	----	"	"	"	§	"	"	yes	"	----	----	152
60	60	32	22	----	870	----	----	------	10	60	----	----	"	"	"	§	"	----	"	"	----	----	153
60	60	25	25	----	1,000	----	----	------	10	60	----	----	"	"	"	§	"	yes	----	"	----	----	154
60	*	140	140	----	5,650	----	3	yes	10	60	----	----	"	"	"	§	"	"	----	"	----	----	155
60	60	80	80	----	2,800	----	3	"	10	60	----	----	"	"	"	§	"	"	----	"	----	----	156
60	60	45	45	----	1,440	----	----	------	10	60	----	----	"	"	"	§	"	"	yes	"	----	----	157
60	60	120	120	----	4,200	----	----	------	10	60	----	----	"	"	"	§	"	"	----	"	----	----	158
60	60	15	15	----	650	----	----	------	10	60	----	----	----	"	"	§	"	"	yes	"	----	----	159
60	60	18	12	----	560	----	----	------	10	60	----	----	yes	"	"	§	"	"	"	"	----	----	160
60	60	6	3	3	190	----	----	------	10	60	----	no	no	"	"	§	"	"	----	no	no	----	161
60	60	12	12	----	450	----	----	------	10	60	----	----	----	"	"	§	"	"	----	yes	----	----	162
60	60	135	135	----	4,750	----	----	------	10	60	----	----	yes	"	"	§	"	"	----	"	----	1	163
60	60	110	110	----	3,800	----	----	------	10	60	----	----	"	"	"	§	"	"	----	"	----	----	164
60	--	25	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	165
60	60	60	60	----	1,800	----	----	------	10	60	----	----	----	yes	no	§	yes	yes	yes	yes	----	----	166
†	†	75	75	----	3,000	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	----	----	167
60	60	30	26	----	650	----	1	no	10	60	----	----	----	"	"	§	"	"	"	"	----	----	168
†	†	6	4	----	225	----	----	------	10	60	yes	----	yes	"	"	§	"	"	----	"	----	----	169
60	60	12	7	----	415	----	----	------	10	60	----	----	----	"	"	§	"	"	----	"	----	----	170
60	60	100	90	----	3,200	----	----	------	10	60	----	----	yes	"	"	§	"	"	----	"	----	----	171
60	60	135	128	----	6,300	----	----	------	10	60	----	----	"	"	"	§	"	"	----	"	----	----	172
60	60	15	6	----	300	----	----	------	10	60	----	----	"	"	"	§	"	"	----	"	----	----	173
60	60	30	5	----	200	----	----	------	10	60	----	----	----	"	"	§	"	"	----	"	----	----	174
60	--	48	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	175
60	60	175	160	----	4,500	----	----	------	10	60	----	----	yes	yes	no	§	yes	yes	yes	yes	----	----	176
60	60	6	6	----	250	----	----	------	10	60	----	----	----	"	"	§	"	"	----	"	----	----	177
60	60	65	65	----	2,160	----	----	------	10	60	----	----	yes	"	"	§	"	"	----	"	----	----	178
60	60	19	17	----	800	----	----	------	10	60	----	----	"	"	"	§	"	"	----	"	----	----	179
54	54	25	15	----	585	----	----	------	10	60	----	----	----	"	"	§	----	----	----	"	----	----	180
‡	‡	13	13	----	800	----	----	------	----	60	----	----	yes	"	"	§	yes	yes	----	"	----	----	181
60	60	150	130	----	4,200	----	----	------	10	60	----	----	"	"	"	§	"	"	----	"	----	----	182
60	--	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	183
60	48	40	10	----	400	----	----	------	10	60	----	----	yes	yes	no	§	yes	yes	----	yes	----	----	184
60	48	35	10	----	460	----	----	------	10	60	----	----	"	"	"	§	"	"	----	"	----	----	185
60	60	225	140	----	4,100	----	----	------	10	60	----	yes	"	"	"	§	"	"	----	"	----	----	186
60	--	110	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	187
48	48	5	5	----	135	----	----	------	8	60	----	----	----	yes	no	§	----	----	----	yes	----	----	188
60	60	1600	1600	----	40,200	----	20	yes	10	60	----	----	yes	"	"	§	yes	no	yes	"	----	1	189
48	48	6	4	----	150	----	----	------	8	60	----	----	"	"	"	§	----	----	----	"	----	----	190
60	--	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	191
60	60	50	26	----	1,050	----	----	------	10	60	----	----	yes	yes	no	§	yes	yes	----	yes	----	----	192
60	60	30	9	8	400	----	----	------	10	60	----	----	"	"	"	§	"	"	yes	"	yes	----	193
60	60	50	40	----	1,475	----	2	yes	10	60	----	----	--	"	"	§	"	"	"	"	----	----	194
60	60	12	3	9	265	----	----	------	10	60	----	----	----	"	"	§	"	"	----	"	yes	----	195
60	60	8	6	----	220	----	----	------	10	60	----	----	yes	"	"	§	"	"	----	"	----	----	196
60	60	12	6	----	245	----	----	------	10	60	----	----	"	"	"	§	"	no	no	"	----	----	197
60	60	12	5	7	250	----	----	------	10	60	----	----	----	"	"	§	"	yes	----	"	yes	----	198
60	60	15	10	----	700	----	----	------	10	60	----	----	yes	"	"	§	"	"	----	"	----	----	199
60	--	25	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	200

* 120 hours-running over-time.
† 120 hours.
‡ 144 hours-running day and night.

§ Not necessary.

Inspection book No. 5. **TABLE No. 4.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
201	Aug.	21	Bay City	Marine Iron Co.	Machinery	run.	part
202	"	21	"	J. N McDonald & Son	Flour and feed	"	full
203	"	22	Saginaw	Lufkin Rule Co.	Rules and tapes	"	"
204	"	23	"	Heinz Pickle Co.	Pickles, etc.	"	"
205	"	23	"	Farmers' Handy Wagons	Wagons	"	"
206	Sept.	8	Bay City	Walworth & Neville Mfg. Co.	Cross-arms, etc.	"	"
207	"	8	"	E. J. Vance Box Co.	Boxes	"	"
208	"	8	"	Briscoe, Plumsteel & Co.	"	"	"
209	"	9	"	McEwan Bros	Lumber	idle	......
210	"	9	"	Bay City Iron Co.	Machinery	run.	part
211	"	9	"	W. H. Nickless	Boxes	"	full
212	"	9	"	Pitts & Co.	Lumber and salt	"	"
213	"	11	"	Meakin's Model Laundry	Laundry work	"	"
214	"	11	"	Eddy Bros.	Lumber	"	"
215	"	11	"	Detroit Mill	" lath, etc.	"	"
216	"	16	"	William F. Lange	Cigars	"	"
217	"	17	"	Bay City Steam Laundry	Laundry work	"	part
218	"	17	"	See Bros.	Furniture	idle	......
219	"	18	Saginaw	Erd Manufacturing Co.	Pianos & harps	run.	full
220	"	18	"	Morley Bros.	Lumbering tools	idle	......
221	"	18	"	Morley Bros.	Harnesses and collars	run.	full
222	"	18	"	Morley Bros.	Forgings	idle	......
223	"	19	"	Louis Kreis	Machinery	run.	full
224	"	19	"	Mattison Roller Bear'g Hub Co.	Roller bearings	"	"
225	"	19	"	Bucheit & Grohmann	Furniture	"	"
226	"	19	"	E. A. McGrath	Brass goods	"	"
227	"	21	W. Bay City	Crumps Manufacturing Co.	Boxes	"	"
228	"	21	"	Handy Bros.	Boxes and lumber	"	"
229	"	23	"	Davidson's Ship Yard	Wooden ships	"	"
230	"	23	"	Wilson Hoop Co.	Hoops	idle	......
231	"	23	"	West Bay City Mfg. Co.	Dressed lumber	run.	full
232	"	24	Crow Island	S. W. Tyler & Son	Shingles	idle	......
233	"	24	"	Saginaw Salt and Lumber Co.	Lumber, lath and salt	run.	full
234	"	25	Carrollton	Bliss Planing Mill	Dressed lumber	"	"
235	"	25	"	A. T. Bliss	Lumber and salt	idle	......
236	"	25	Zilwaukee	C. L. Grant & Co.	"	"	......
237	"	25	"	Central Lumber Co.	" salt, etc.	"	......
238	"	25	Saginaw	C. K. Eddy & Son	" salt and lath	"	......
239	"	26	"	C. Merrill & Co.	" " " "	"	......
240	"	26	"	C. S. Bliss & Co.	"	run.	full
241	"	29	Kawkawlin	Haggarty & Mosher	Hoops	idle	......
242	"	29	Gladwin	Brown & Van Ness Planing Mill	Dressed lumber	"	......
243	"	29	"	Brown & Van Ness Planing Mill	Lumber	"	......
244	"	29	"	L. A. Mabie	Shingles	"	......
245	"	29	"	Saylor Hoop Co.	Hoops	"	......
246	"	30	Pinconning	Edward Jennings	Heading and shingles	run.	full
247	"	30	"	W. H. Ford	" and staves	idle	......
248	Oct.	1	Standish	James Norn	Lumber	"	......
249	"	1	"	Standish Stave & Heading Co.	Staves and heading	"	......
250	"	1	"	Gray Milling Co.	Flour and shingles	run.	full

District No. 4. *O. O. Krapf, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1886.
60	48	20	8	----	$460	----	----	------	10	60	yes	----	yes	yes	no	‡	yes	yes	----	yes	----	----	201
*	*	15	15	----	670	----	----	------	----	60	----	----	"	"	"	‡	"	"	----	"	----	----	202
60	60	65	50	15	1,800	----	----	------	10	†30	----	----	"	"	"	‡	"	"	yes	"	yes	1	203
60	60	57	22	35	1,875	----	----	------	10	45	----	----	"	"	"	‡	"	"	----	"	"	----	204
60	60	70	28	2	900	----	----	------	10	†30	----	---	"	"	"	‡	"	no	yes	"	"	----	205
60	60	40	30	----	1,000	----	2	yes	10	60	----	----	----	"	"	‡	"	yes	"	"	----	----	206
60	60	52	52	----	1,350	----	2	"	10	60	----	----	----	"	"	‡	no	no	"	"	----	----	207
60	60	32	32	----	850	----	----	------	10	60	----	----	----	"	"	‡	"	yes	"	"	----	----	208
60	--	140	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	209
60	48	50	12	----	900	----	----	------	10	60	----	----	yes	yes	no	‡	yes	yes	----	yes	----	----	210
60	60	30	25	----	700	----	----	------	10	60	----	----	"	"	"	‡	"	"	yes	"	----	----	211
60	60	135	135	----	5,500	----	----	------	10	60	----	----	"	"	"	‡	"	"	----	"	----	----	212
60	60	10	2	5	110	---	----	------	10	60	----	----	no	"	"	‡	"	"	----	no	no	----	213
60	60	125	125	----	5,000	----	----	------	10	60	----	----	yes	"	"	‡	"	"	----	yes	----	----	214
60	60	135	135	----	5,600	----	----	------	10	60	----	----	"	"	"	‡	"	"	----	"	----	----	215
48	48	12	4	2	280	----	----	------	8	60	----	----	"	"	"	‡	----	----	----	no	no	----	216
60	54	12	4	8	285	----	----	------	10	60	----	----	"	"	"	‡	yes	yes	----	yes	yes	----	217
60	--	18	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	218
60	60	34	32	2	1,200	----	----	------	10	60	----	----	yes	yes	no	‡	yes	yes	yes	yes	yes	----	219
60	--	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	220
60	60	40	17	3	1,000	----	----	------	10	50	yes	yes	yes	yes	no	‡	yes	yes	----	yes	yes	----	221
60	--	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	222
60	60	6	2	----	90	----	----	------	10	60	----	----	----	yes	no	‡	yes	yes	----	yes	----	----	223
60	60	6	3	----	100	----	----	------	----	60	----	----	yes	"	"	‡	"	"	----	"	----	----	224
60	60	12	5	----	200	----	----	------	10	50	----	---	"	"	"	‡	"	"	yes	"	----	----	225
60	60	50	4	3	170	----	----	------	10	50	----	----	"	"	"	‡	"	"	"	"	yes	----	226
60	60	125	125	----	2,500	----	30	yes	10	60	yes	yes	"	"	"	‡	"	"	"	"	----	----	227
60	60	105	105	----	2,250	----	4	"	10	60	----	----	"	"	"	‡	"	"	"	"	----	----	228
60	60	800	250	----	8,300	----	----	------	10	60	----	----	"	"	"	‡	"	"	"	"	----	----	229
60	--	58	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	230
60	60	10	5	----	160	----	----	------	10	50	----	----	yes	yes	no	‡	yes	yes	yes	yes	----	----	231
60	--	25	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	232
60	60	180	140	----	4,800	----	----	------	10	60	----	----	yes	yes	no	‡	yes	yes	----	yes	----	----	233
60	60	15	11	----	840	----	----	------	10	60	----	----	----	"	"	‡	"	"	yes	"	----	----	234
60	--	84	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	235
60	--	40	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	236
60	--	120	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	237
60	--	140	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	238
60	..	148	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	239
60	60	80	30	----	1,000	----	----	------	10	60	----	----	yes	yes	no	‡	yes	yes	----	yes	----	----	240
60	--	45	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	241
60	--	4	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	242
60	--	10	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	243
60	--	18	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	244
60	--	32	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	245
60	60	65	65	----	2,000	----	----	------	10	60	----	----	yes	yes	no	‡	yes	yes	yes	yes	----	----	246
60	--	45	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	247
60	--	40	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	248
60	--	50	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	249
60	60	12	18	----	550	----	----	------	10	60	----	----	yes	yes	no	‡	yes	yes	yes	yes	----	----	250

* 144 hours-running day and night. † Permit given by inspector. ‡ None required.

Inspection book No. 6. **TABLE No. 4.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
251	Oct.	1	Standish....	Star Wooden Ware Works.......	Tubs and pails...........	idle	......
252	"	2	West Branch	French Lumber Co..................	Shingles.................	"	......
253	"	2	"	French Lumber Co..................	Lumber..................	"	......
254	"	3	Lewiston	Michelson-Hanson Lumber Co...	Dressed lumber..........	run.	full
255	"	3	"	Michelson-Hanson Lumber Co...	Lumber and lath.........	"	"
256	"	3	Grayling.....	Salling & Hanson................	Dressed lumber..........	"	"
257	"	3	"	Salling & Hanson................	Lumber and lath.........	"	"
258	"	3	"	Salling & Hanson................	" and shingles....	"	"
259	"	3	Waters.......	Henry Stephens & Co.	" and lath.........	"	"
260	"	5	Gaylord	Dayton Last Block Works........	Last blocks..............	"	"
261	"	5	"	Jackson & Wiley..................	Hoops and staves........	"	"
262	"	6	Cheboygan...	J. F. Maloney.....................	Beer.....................	"	"
263	"	6	" ...	Pfister & Vogel Leather Co.	Leather..................	"	"
264	"	6	" ...	W. & A. McArthur	Flour, feed, etc...........	"	"
265	"	6	" ...	W. & A. McArthur	Lumber..................	idle	......
266	"	7	" ...	Cheboygan Lumber Co............	" and lath........	run.	full
267	"	7	" ...	D Quay & Sons	Shingles..................	idle	......
268	"	7	" ...	Star Steam Laundry..............	Laundry work............	run.	full
269	"	7	" ...	M. D. Olds.	Staves....................	"	"
270	"	8	" ...	Whitehall Lumber Co..............	Lumber...................	idle	......
271	"	8	" ...	Pelton & Reid......................	" and lath........	run.	full
272	"	8	" ...	Swift Bros.	" "	"	"
273	"	8	" ...	L Littlejohn	Shingles..................	"	"
274	"	9	Duncan City.	Thompson, Smith & Sons.........	Lumber and lath	idle	......
275	"	20	Bay City.....	Matthew Lamont..................	Sash, doors and lumber.	run.	full
276	"	20	"	Lewis Manufacturing Co.	" " etc...........	"	part
277	"	20	"	Bay Manufacturing Co.	Boxes and lumber.......	"	full
278	"	20	"	Andrews & Albee..................	"	idle	......
279	"	20	"	Miller Bros.........................	Dressed lumber..........	"	......
280	"	21	Carrollton....	William B. Mershon & Co.	Sash, doors, boxes, etc...	run.	full
281	"	21	" ...	Brewer Lumber Co.................	Dressed lumber & boxes	"	"
282	"	23	Saginaw, E.S.	Feige Desk Co.—No. 2............	Office desks.............	"	"
283	"	23	"	Saginaw Manufacturing Co.......	Dressed lumber, etc......	"	"
284	"	23	"	Green, Ri g & Co.................	Lumber, lath and salt ..	"	"
285	"	24	Saginaw, W.S.	Grinnell Seed Co..................	Seeds.....................	"	"
286	"	26	"	Saginaw Milling Co...............	Flour, feed, etc.	"	"
287	"	26	Saginaw....	Briggs & Cooper..................	Lumber and salt	"	"
288	"	26	"	A. D. Camp	Staves....................	idle	......
289	Nov.	2	"	F. W. Carlisle & Co..............	Leather..................	run.	full
290	"	2	"	Charles Desham	Barrels	"	"
291	"	2	"	U. S. Graphite Co.................	Graphite & graph.paints	"	"
292	"	2	"	Charles Lee........................	Dressed lumber, etc......	"	"
293	"	2	"	Charles Lee	Lumber..................	idle	......
294	"	4	"	F. & P. M. R. R. Shops...........	General repairs..........	run.	part
295	"	4	"	H. & W. Helu.....................	Extracts..................	"	full
296	"	4	"	J. P. Beck	Carriages and buggies..	"	"
297	"	4	"	F. H. Mertz.......................	Cigars....................	"	"
298	"	5	Coleman.....	E P. Hickox.......................	Hoops and staves........	"	"
299	"	5	"	Simmons, McMorris & Co.	Heading and staves.....	idle	......
300	"	5	"	Willis & Mason	Shingles and feed	"	......

District No. 4. *O. O. Krapf, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	..	100	....	....	......	....	....	......	....	...	....	....	....	....	....	....	...	....	....	....	....	....	251
60	..	24	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	252
60	..	30	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	253
60	60	12	12	....	$400	....	....	......	10	60	....	....	....	yes	no	‡	yes	yes	yes	yes	....	....	254
60	60	50	38	....	1,100	....	....	......	10	60	....	....	yes	“	“	‡	“	“	....	“	....	....	255
60	60	24	24	....	775	....	....	......	10	60	....	....	....	“	“	‡	“	“	yes	“	....	....	256
60	60	45	45	....	1,050	....	....	......	10	60	....	....	yes	“	“	‡	“	“	....	“	....	....	257
60	60	53	53	....	1,600	....	....	......	10	60	....	....	“	“	“	‡	“	“	....	“	....	....	258
60	60	180	180	....	6,500	....	....	......	10	60	....	....	“	“	“	‡	“	“	yes	“	....	....	259
60	60	125	68	....	2,800	....	....	......	10	60	....	....	“	“	“	‡	“	“	....	“	....	....	260
60	60	100	100	....	4,200	...	....	......	10	60	....	....	“	“	“	‡	“	“	....	“	....	....	261
60	60	7	7	....	300	....	....	......	10	60	....	....	“	“	“	‡	“	“	....	“	....	....	262
60	60	150	125	....	5,000	....	1	yes	10	60	yes	yes	“	“	“	‡	“	“	....	“	....	....	263
60	60	6	6	....	280	....	....	......	10	60	....	....	“	“	“	‡	“	“	....	“	....	....	264
60	..	120	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	265
60	60	65	65	....	2,580	....	....	......	10	60	....	....	yes	yes	no	‡	yes	yes	....	yes	....	....	266
60	..	27	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	267
60	60	10	2	4	200	....	....	......	10	60	....	....	....	yes	no	‡	yes	yes	....	yes	yes	....	268
60	60	40	40	....	1,000	....	....	......	10	60	....	....	....	“	“	‡	“	“	....	“	....	....	269
60	..	80	....	....	......	....	....	......	....	....	....	....	....	....	....	....	...	....	....	....	....	....	270
60	60	75	75	....	3,000	....	....	......	10	60	....	....	yes	yes	no	‡	yes	yes	....	yes	....	....	271
60	60	90	90	....	3,200	....	....	......	10	60	....	....	“	“	“	‡	“	“	....	“	....	....	272
60	60	16	16	....	550	1	....	......	10	60	....	....	“	“	“	‡	“	“	....	“	....	....	273
60	..	114	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	274
60	60	90	85	....	1,500	....	....	......	10	60	....	....	yes	yes	no	‡	no	no	yes	yes	....	....	275
60	54	20	18	....	550	1	....	......	10	60	....	....	“	“	“	‡	“	yes	“	“	...	....	276
60	60	40	30	....	1,150	2	2	yes	10	60	....	....	....	“	“	‡	yes	“	“	“	....	....	277
60	..	10	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	278
60	..	30	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	279
60	60	375	242	....	6,500	....	24	yes	10	†40	yes	yes	yes	yes	no	‡	yes	yes	yes	yes	....	3	280
60	60	150	60	....	1,300	....	....	......	10	60	....	....	....	“	“	‡	“	“	“	“	....	....	281
60	60	60	35	....	1,400	...	....	......	10	45	yes	yes	yes	“	“	‡	“	“	“	“	....	....	282
60	60	200	150	....	3,800	1	17	yes	10	60	“	“	“	“	“	yes	“	“	“	“	....	6	283
60	60	125	125	...	4,000	....	....	......	10	60	...	....	“	“	“	‡	“	“	....	“	....	...	284
60	60	56	4	52	775	....	....	......	10	60	yes	....	“	“	“	‡	....	....	....	“	yes	....	285
60	*	71	32	39	2,000	....	....	......	10	60	....	yes	“	“	“	yes	yes	yes	....	“	“	....	286
60	60	60	12	....	850	....	....	......	10	45	....	....	“	“	“	‡	“	“	yes	“	....	....	287
60	..	22	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	288
60	60	60	40	....	2,000	....	....	......	10	60	....	....	yes	yes	no	‡	yes	yes	....	yes	....	....	289
60	60	*20	20	....	780	....	....	......	10	60	....	....	“	“	“	‡	....	....	....	“	....	....	290
60	60	12	8	....	300	....	....	......	10	60	....	....	....	“	“	‡	yes	yes	....	“	....	....	291
54	54	20	15	....	600	....	....	......	9	60	yes	yes	yes	“	“	‡	“	“	yes	“	....	....	292
60	..	23	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	293
60	48	330	200	....	9,000	....	....	......	10	60	....	....	yes	yes	no	‡	yes	yes	yes	yes	....	....	294
60	60	4	4	....	200	....	....	......	10	60	....	....	“	“	“	‡	....	....	....	“	....	....	295
60	60	14	14	....	600	....	....	......	10	60	....	no	“	“	“	‡	....	....	....	“	....	....	296
48	48	8	8	....	340	....	1	yes	8	60	....	....	....	“	“	‡	....	....	....	“	....	....	297
60	60	40	20	....	675	....	....	......	10	60	....	....	....	“	“	‡	yes	yes	....	“	....	....	298
60	..	15	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	299
60	..	6	....	....	......	....	....	......	....	....	....	....	....	....	....	....	....	....	....	....	....	....	300

* 144 hours-employés in bean and pea department work 10 hours per day; men in mill work 12.

† Permit given by inspector. ‡ None required.

Inspection book No. 7. **TABLE No. 4.—Continued.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
301	Nov. 5	Coleman	Willis & Mason	Shingles, feed, etc.	idle	
302	“ 5	“	Geo. Cooper	Staves and heading	“	
303	“ 5	“	J. E. Curtice & Son	“ “ “	run.	full
304	“ 6	Beaverton	Beaverton Cooperage Co.	“ “ hoops	“	“
305	“ 6	“	Ross Brothers	Shingles & cedar blocks	“	“
306	“ 7	Bay City	Michigan Box Co.	Boxes	idle	
307	“ 7	“	The Hardwood Co.	Finished lumber	“	
308	“ 7	“	Bay City Excelsior Works	Excelsior	“	
309	“ 7	“	Craney Manufacturing Co.	Vacuum pans	“	
310	“ 7	“	South End Lumber Co.	Lumber and salt	“	
311	“ 9	“	Julius Wilhelm	Cigars	run.	full
312	“ 9	“	Hampton Manufacturing Co.	Dressed lumber, etc.	idle	
313	“ 9	“	Eickemeyer, Kramm & Co.	Sash, doors, etc.	run.	full
314	“ 9	“	L. B. Dolsen Box Co.	Boxes	“	“
315	“ 9	“	Meyer & Russell	Mattresses, springs and pillows.	idle	
316	“ 10	Saginaw	Saginaw Globe	Printed matter	run.	full
317	“ 10	“	Swift Electric Light Co.	Electricity	“	“
318	“ 10	“	R. Gottschalk	Cigars	“	“
319	“ 10	Paines	Edwin Andrews	Shingles	idle	
320	“ 10	St. Charles	St. Charles Hoop Co.	Hoops	“	
321	“ 10	Oakley	F. F. Spiegel	Flour, feed, etc.	“	
322	“ 11	Owosso	Johnson Baking Co.	Crackers, etc.	run.	full
323	“ 11	“	Owosso Stave and Hoop Co.	Staves and hoops	“	part
324	“ 11	“	Ann Arbor R. R. Shops	General repairs	“	full
325	“ 11	“	Estey Carriage Co.	Carriages	idle	
326	“ 12	“	Owosso Carriage Co.	“	run.	part
327	“ 12	“	Michigan Package Co.	Paper packages	“	“
328	“ 12	“	The Argus	Printed matter	“	full
329	“ 12	“	Ann Arbor Milling Co.	Feed and grain	“	“
330	“ 12	“	City Steam Laundry	Laundry work	“	“
331	“ 12	“	L. E. Woodard	Sash, doors & furniture.	“	part
332	“ 13	“	Estey Mfg. Co.—Factories A & B.	Furniture	“	“
333	“ 13	“	Owosso Handle works	Handles	idle	
334	“ 13	“	W. H. Mason & Son	Spokes	“	
335	“ 13	“	Owosso Manufacturing Co.	Screens, snow shovels, etc.	run.	full
336	“ 13	“	The Times	Printed matter	“	“
337	“ 13	“	Castree & Shaw	Machinery	“	part
338	“ 13	“	Owosso Casket Works	Caskets and coffins	“	full
339	“ 13	“	Robbins Table Co.	Tables	“	part
340	“ 14	Flint	Flint Pantaloon Co.	Pantaloons	“	full
341	“ 14	“	Holmes & Wells Cigar Co.	Cigars	“	“
342	“ 14	“	Weller & Austin	Printing and cigar boxes	“	“
343	“ 14	Lapeer	J. A. Hungerford & Son	Carriages and buggies	idle	
344	“ 14	“	Lapeer Handle factory	Handles, etc.	“	
345	“ 14	“	Wm. McDonald	Machinery and castings	“	
346	“ 14	“	Centennial Mills	Flour, feed, etc.	run.	full
347	“ 17	Flint	C. Rippe	Cigars	“	“
348	“ 17	“	Home Steam Laundry	Laundry work	“	“
349	“ 17	“	Flint Journal	Printed matter	“	“
350	“ 17	“	Abe Davis	Cigars	“	“

District No. 4. *O. O. Krapf, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	--	6	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	301
60	--	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	302
60	60	52	40	----	$1,450	----	----	------	10	45	----	----	----	yes	no	‡	yes	yes	yes	yes	----	----	303
60	60	50	40	----	1,500	----	2	yes	10	60	----	----	yes	"	"	‡	"	"	"	"	----	----	304
60	60	80	80	----	2,300	----	----	------	10	60	----	----	"	"	"	‡	"	"	"	"	----	----	305
60	--	44	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	306
60	--	35	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	307
60	--	10	----	----	------	----	----	------	---	----	----	----	----	----	----	----	----	----	----	----	----	----	308
60	--	60	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	309
60	--	178	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	310
48	48	10	6	----	240	----	----	------	8	60	----	----	----	yes	no	‡	----	----	----	yes	----	----	311
60	--	50	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	312
60	60	20	16	----	625	----	----	------	10	45	----	----	yes	yes	no	‡	yes	yes	yes	yes	----	----	313
60	60	35	25	----	600	----	----	------	10	45	----	----	"	"	"	‡	"	no	"	"	----	----	314
60	--	18	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	315
60	60	16	15	1	925	----	----	------	10	60	----	yes	yes	yes	no	‡	yes	yes	----	yes	yes	----	316
*	*	16	16	----	750	----	----	------	----	60	----	----	----	"	"	‡	"	"	----	"	----	----	317
48	48	5	2	1	100	----	----	------	8	60	----	----	yes	"	"	‡	----	----	----	"	yes	----	318
60	--	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	319
60	--	40	----	----	------	----	----	------	----	----	----	----	----	----	----	----	---	----	----	----	----	----	320
60	--	5	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	321
60	60	9	7	2	350	----	----	------	10	60	----	----	----	yes	no	‡	yes	yes	----	yes	yes	----	322
60	54	16	10	----	340	----	----	------	10	60	----	----	----	"	"	‡	"	"	yes	"	----	----	323
60	60	125	125	----	6,000	----	----	------	10	60	----	----	yes	"	"	‡	"	"	----	no	----	----	324
60	--	40	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	325
60	54	40	10	----	330	----	----	------	10	60	----	----	yes	yes	no	‡	yes	yes	----	yes	----	----	326
60	54	15	2	6	240	----	----	------	10	50	yes	----	"	"	"	‡	"	"	----	"	yes	----	327
60	60	12	8	2	470	----	----	------	10	60	----	----	"	"	"	‡	"	"	----	"	"	----	328
60	60	3	3	----	110	----	----	------	10	60	----	----	"	"	"	‡	"	"	----	"	----	----	329
60	60	12	4	8	350	----	----	------	10	60	----	----	----	"	"	‡	"	"	----	"	yes	----	330
60	48	200	150	2	4,600	----	1	yes	10	60	yes	yes	yes	"	"	‡	"	"	yes	"	"	----	331
60	54	500	500	----	13,500	----	12	†no	10	60	"	"	"	"	"	‡	"	"	"	"	---	----	332
60	--	10	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	333
60	--	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	334
60	60	200	130	5	3,000	----	3	yes	10	60	----	yes	yes	yes	no	‡	yes	yes	yes	yes	yes	1	335
60	60	10	5	----	200	----	----	------	10	60	----	----	----	"	"	‡	"	"	----	"	----	----	336
60	54	15	5	----	170	----	----	------	10	60	----	----	----	"	"	‡	"	"	----	"	----	----	337
60	60	150	125	15	4,600	----	----	------	10	60	yes	yes	yes	"	"	yes	"	"	yes	no	yes	----	338
60	54	50	35	----	1,200	----	2	yes	10	50	----	----	"	"	"	‡	"	"	"	yes	----	----	339
60	60	75	8	22	900	----	----	------	10	60	yes	yes	"	"	"	‡	"	"	----	"	yes	----	340
48	48	23	18	4	900	----	----	------	8	60	----	----	"	"	"	‡	----	----	----	"	"	----	341
60	60	10	4	8	245	----	----	------	10	60	----	----	"	"	"	‡	yes	yes	----	"	"	----	342
60	--	8	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	343
60	--	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	344
60	--	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	345
60	60	6	6	----	300	----	----	------	10	60	----	----	yes	yes	no	‡	yes	yes	----	yes	----	----	346
48	48	6	3	----	100	----	----	------	8	60	----	----	"	"	"	‡	----	----	----	"	----	----	347
60	60	16	5	6	400	----	----	------	10	60	----	----	----	"	"	‡	yes	yes	----	"	yes	----	348
60	60	12	9	8	350	----	----	------	10	60	----	----	yes	"	"	‡	"	"	----	"	no	----	349
48	48	5	4	1	200	----	----	------	8	60	----	---	"	"	"	‡	----	----	----	"	----	----	350

* 144 hours–running day and night. † Not in factory A. ‡ None required.

Inspection book No. 8.

TABLE No. 4.—CONCLUDED.—

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
851	Nov. 17	Flint	M. Ephraim	Cigars	run.	full
852	" 17	"	Warren Machine Works	Machinery	"	part
853	" 18	"	Wolverine Citizen	Printed matter	"	full
854	" 18	"	Classen & Streat	Cigars	"	"
855	" 18	"	Flint Cigar Co.	"	"	"
856	" 18	"	Old Sol Cigar Co.	"	"	"
857	" 18	"	W. A. Paterson	Carriages, etc.	"	"
858	" 18	"	S. C. Randall & Co.	Dressed lumber, etc.	"	part
859	" 18	"	Houran & Whitehead	" "	"	"
860	" 19	"	J. B. Armstrong Mfg. Co.	Springs & steel special.	idle	......
861	" 19	"	Revolving Hat Case Co.	Hat cases	run.	full
862	" 19	"	Barney Granite & Marble Wk's.	Cut stone & monuments	"	"
863	" 19	"	Durant-Dort Carriage Co.	Vehicles	"	part
864	" 19	"	Flint Woolen Mills	Woolen goods	"	"
865	" 19	"	Beardslee, Gillies & Co.	Sash, doors, etc.	idle	......
866	" 20	"	W. F. Stewart	Buggie bodies	run.	full
867	" 20	"	Hearsch & Burdick	Sash, doors & furniture	§idle	......
868	" 20	"	Flint Wagon Works	Wagons and buggies	run.	full
869	" 21	Caro	W. A. Forbes & Co.	Sash, doors, etc.	"	part
870	" 21	"	Tuscola Co. Advertiser	Printed matter	"	full
871	" 21	"	E. Parks	Shingles	idle	......
872	" 21	Vassar	Frank Miller	Lumber	"	......
873	" 21	"	Frank Miller	Sash, doors, etc.	run.	full
874	" 21	"	Vassar Woolen Mills	Woolen goods	"	"
875	" 24	Akron	Mallory & Shannon	Cheese boxes	idle	......
876	" 24	"	Liken & Bach	Staves and heading	"	......
877	" 24	Unionville	Liken & Bach	" " "	"	......
878	" 25	Sebewaing	Sebewaing Mfg. Co.	Sash, doors, etc.	run.	part
879	" 25	"	Liken & Bach	Staves and heading	"	full
880	" 25	"	F. F. Winter	Sash, doors, etc.	"	"
881	" 27	Port Huron	C. & G. T. R. R. Shops	R. R. repairs	"	part
882	" 27	"	C. & G. T. R. R. Car Shops	Cars	"	"
883	" 28	"	Jenks Ship Building Co.	Boats	idle	......
884	" 28	"	Dunford & Alverson	"	"	......
885	" 28	"	Mich. Sulphite Fibre Co.	Fibre	run.	full
886	" 1	Saginaw	Linton Mfg. Co.	Boxes, sash, doors, etc.	"	part
887	" 1	"	Valley Mfg. Co.	Pants, overalls, etc.	"	full
888	" 2	Bay City	Standard Machine Works	Machinery	"	part
889	" 2	"	Geo. H. Downing	Cigars	"	full
890	" 2	"	Bay City Woodenware Works	Tubs and pails	"	"
891	" 4	"	Valley Scrap Iron Co.	Rags and junk	idle	......
892	" 4	"	Graves & Co.	Shingles	"	......
893	" 4	"	Crystal Water Co.	Mineral water	run.	part
894	" 4	"	U. S. Baking Co.	Crackers and biscuits	"	full
895	" 4	"	C. C. Barker	Lumber and salt	idle	......
896	" 4	"	E. L. Hitchcock	"	"	......

§ New concern—just ready to start.

District No. 4. *O. O. Krapf, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. h'rs males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
48	48	15	7	1	$400	----	----	------	8	60	----	----	yes	yes	no	*	----	----	----	yes	----	----	351
60	48	15	4	----	150	----	----	------	10	60	----	----	"	"	"	*	yes	yes	----	"	----	----	352
60	60	9	6	1	300	----	----	------	10	60	----	----	"	"	"	*	"	"	----	"	----	----	353
48	48	14	13	1	700	----	----	------	8	60	----	----	----	"	"	*	----	----	----	"	yes	----	354
48	48	13	9	4	700	----	----	------	8	60	----	----	----	"	"	*	----	----	----	"	"	----	355
48	48	18	8	1	400	----	----	------	8	60	----	----	----	"	"	*	----	----	----	"	----	----	356
60	60	150	70	18	3,350	----	----	------	10	60	yes	yes	yes	"	"	yes	yes	yes	yes	"	yes	----	357
60	48	25	21	----	900	----	----	------	10	60	----	----	"	"	"	*	"	no	"	"	----	----	358
60	54	12	12	----	400	1	----	------	10	60	----	----	----	"	"	*	"	"	"	"	----	----	359
60	--	65	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	360
60	60	8	7	1	350	----	----	------	10	60	----	----	yes	yes	no	*	----	----	----	yes	----	----	361
60	60	15	14	1	680	----	----	------	10	60	----	----	----	"	"	*	yes	yes	----	"	yes	----	362
60	54	110	58	2	4,100	----	----	------	10	60	yes	yes	yes	"	"	yes	"	"	yes	"	"	----	363
60	45	120	48	48	3,100	----	----	------	10	45	----	----	no	"	"	"	"	"	----	"	"	----	364
60	--	28	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	365
60	60	100	85	----	3,600	----	----	------	10	60	----	----	----	yes	no	*	yes	yes	yes	yes	----	----	366
60	--	5	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	367
60	60	150	75	----	2,600	----	----	------	10	60	----	no	yes	yes	no	yes	yes	yes	yes	yes	----	----	368
60	54	18	7	----	250	----	----	------	10	60	----	----	----	"	"	*	"	"	"	"	----	1	369
60	60	9	5	4	200	----	----	------	10	60	----	----	yes	"	"	*	"	"	----	"	yes	----	370
60	--	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	371
60	--	30	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	372
60	60	12	8	----	300	----	----	------	10	45	----	----	yes	yes	no	*	yes	yes	yes	yes	----	----	373
60	60	50	28	7	850	----	----	------	10	45	yes	----	"	"	"	*	"	"	----	"	yes	----	374
60	--	7	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	375
60	--	30	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	376
60	--	30	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	377
60	54	30	16	----	500	1	1	yes	10	60	yes	yes	yes	yes	no	*	yes	yes	yes	yes	----	1	378
60	60	35	35	----	900	----	2	"	10	60	----	----	----	"	"	*	"	"	"	"	----	----	379
60	60	8	6	----	240	----	----	------	10	60	----	----	----	"	"	*	"	"	"	"	----	----	380
60	54	375	300	----	12,500	----	----	------	10	60	yes	yes	yes	"	"	*	"	"	"	"	----	----	381
60	48	350	122	----	4,600	----	----	------	10	60	"	"	"	"	"	*	"	"	"	"	----	----	382
60	--	50	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	383
60	--	150	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	384
¶	¶	180	55	85	3,500	----	----	------	----	60	----	----	yes	yes	no	*	yes	yes	----	yes	yes	----	385
60	54	250	116	----	1,500	----	----	------	10	45	yes	yes	"	"	"	*	no	"	yes	"	----	11	386
60	60	50	6	35	1,000	----	----	------	10	†30	----	----	"	"	"	*	yes	"	----	"	yes	----	387
60	54	60	25	----	1,300	----	----	------	10	60	----	----	"	"	"	*	"	"	yes	"	----	----	388
48	48	10	8	1	400	----	----	------	8	60	----	----	----	"	"	*	----	----	----	"	----	----	389
60	60	275	265	10	‡	5	‖	no	10	60	yes	yes	yes	"	"	*	yes	yes	no	"	yes	----	390
60	--	50	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	391
60	--	24	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	392
60	54	11	5	3	175	----	----	------	10	60	yes	yes	yes	yes	no	*	yes	yes	----	yes	yes	----	393
60	60	25	15	5	600	----	----	------	10	60	"	"	"	"	"	*	"	"	----	"	"	----	394
60	--	35	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	395
60	--	45	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	396

¶ 144 hours. ‡ Pay roll not given. † Permit given by inspector. * None required.
‖ Impossible for inspector to give exact number.

DEDUCTIONS FROM THE WORK IN DISTRICT NO. 4.

Organization of District.

This district has its headquarters at Saginaw. Much of its territory is in the newer part of the State, where lumber has been a great industry. Many of the lumber manufactories are idle or have been removed for want of timber, which is fast disappearing. The district is composed of 23 counties, as follows:

Alcoma,
Alpena,
Arenac,
Bay,
Cheboygan,
Crawford,
Genesee,
Gladwin,
Huron,
Iosco,
Lapeer,
Midland,
Montmorency,
Ogemaw,
Oscoda,
Otsego,
Presque Isle,
Roscommon,
Saginaw,
St. Clair,
Sanilac,
Shiawassee,
Tuscola.

Factories Inspected.

There were 396 factories inspected during the year, of which 308 were running, and 88 were idle. Of the 308 which were running, 278 were working full time, and 30 on part time.

This shows that over 22 per cent of the factories inspected were idle, as compared with 13 per cent in 1895. Of the factories running, 9 per cent were running part time, as against 6 per cent in 1895.

Hours of Labor Per Week.

Hours per week, when running full time	24,372
Hours per week, at date of inspection	18,909
Hours lost per week	5,463

This means a loss of 546 days of 10 hours each every week, or a daily loss of 91 days. Computed at $1.31 per day, the average daily wages paid for all labor by these factories, and it means a daily loss to labor of

$119.21, or an annual loss of $37,312.73 as compared with earnings if these factories were running full time.

As to Employés and Pay.

Number employés, running full capacity	22,237
Number of employés at date inspection	13,791
Number less full capacity	8,446

Compared with running full capacity, these factories would employ 8,446 more persons, which at $1.31 would aggregate $11,064.26 daily, or 3,463,113.38 annually. This, taken with the loss of $37,312.73, the loss by reason of running short time, we find an annual loss to labor in these factories alone of $3,500,426.11, and this at the rate of wages much less than formerly paid.

Number of males employed	12,994
Number of females employed	797
Whole number employed at date of inspection	13,791

Number employing females	83

Total monthly pay-roll of factories running	$469,394 00
Average monthly pay-roll of factories running	1,523 68
Average monthly pay per employé	34 03
Average daily pay per employé, about	1 31

Child Labor and Minors.

Number of factories employing children under 14	12
Number of children under 14 employed	25
Number of children under 14 discharged	25

Number of factories employing children between 14 and 16	44
Number of children between 14 and 16 employed	206

Number factories where statements as to age were filed	41
Number factories where statements as to age were not filed	3
Whole number factories employing children, as above	44

The inspector found more children under 14 employed than in 1895. They were all promptly discharged. In 1895 he found 70 factories employing children between the ages of 14 and 16, as compared with 44, the present year. In 1895, 300 such children were found employed, as against 206 at date of last inspection. There is a marked tendency toward employing less child labor with the factories in this district.

The law as to keeping registers and filing statements of the ages of children employed is generally observed, only three being found where such statements were not filed. The inspector is very watchful regarding any kind of child labor.

In no factory were minors allowed to clean machinery while in motion, and in no factory were females under 21 or males under 18 required to work more than 60 hours per week. The following shows the hours worked per day in each factory found running:

Number factories working 12 hours per day	1
Number factories working 10 hours per day	278
Number factories working 9½ hours per day	1
Number factories working 9 hours per day	4
Number factories working 8 hours per day	24
Whole number factories running	308

Nearly 91 per cent of these factories work on the 10-hour plan, only one being found where a longer day was exacted, and no minors were employed there.

Dinner Hour.

Number factories that allow 60 minutes for dinner	280
Number factories that allow 50 minutes for dinner	6
Number factories that allow 45 minutes for dinner	18
Number factories that allow 40 minutes for dinner	1
Number factories that allow 30 minutes for dinner	3
Whole number factories running	308

Over 90 per cent of the factories in this district allow a full hour for dinner. Only four were found where a shorter time was asked than prescribed by law, which was granted by the inspector.

Hoisting Shafts, Well Holes and Elevator Protection.

Number factories where hoisting shafts are not used	270
Number factories where hoisting shafts were protected	38
Whole number factories running	308

Number factories where elevators are not used	259
Number factories where elevators were properly protected	45
Number factories where orders were made	4
Whole number factories running	308

This indicates a marked improvement in this most needed protection over 1895, where 11 hoisting shafts and 14 elevators were found unprotected. Unprotected elevators and hoisting shafts cannot be tolerated. Danger in this direction in Michigan factories is reduced almost to the minimum.

Stair Protection.

Number factories where stairs are properly protected	213
Number factories where there are no stairs	92
Number factories where orders were made	3
Whole number factories running	308

Protection to stairs means proper hand-rails, stairs suitably screened at sides and bottom, rubber for steps where necessary, and anything pertaining to the safety of employés. In 1895, 26 places were found where stairs were not properly protected, as against three in 1896.

Doors.

In every factory inspected it was found that the doors swing outward or slide where practicable, and in no place were doors locked or bolted during working hours. The law regarding doors is rigidly observed in this district.

Fire Escapes.

Of the 308 factories running it was decided that 298 did not need fire escapes; nine were properly provided with them, while one order was made.

Four fire escapes were ordered in 1895, the inspector finding his orders satisfactorily complied with. The inspector has been very watchful in regard to this necessary protection of employés who work in factories two or more stories high.

Machinery, etc.

Number factories using shifters for throwing belts, and where loose pulleys are provided	260
Number factories where they are not necesary	39
Number factories where such appliances were ordered	9
Whole number factories running	308

Number factories where vats, pans, saws, and machinery was properly protected	247
Number factories where there was no machinery	40
Number factories where orders were made	21
Whole number factories running	308

As compared with the inspection of 1895, this shows a marked improvement in regard to this kind of protection. Under this head many verbal orders are made, and generally complied with without further notice.

Sanitary.

Number factories where dust arresters are provided	96
Number factories where dust arresters are not necessary	209
Number orders made	3
Whole number factories running	308

As compared with 1895, a marked improvement can be seen in the use of blowers and dust arresters, the orders being 13 for that year, against three for 1896.

Number factories having suitable wash-rooms and water closets	303
Number factories where orders were made	5
Whole number factories running	308

Number having separate closets for females	72
Number not requiring separate closets for females	232
Number where orders were made	4
Whole number factories running	308

In anything pertaining to the sanitary condition of factories the inspector was very minute and experienced very little trouble, it being generally recognized that suitable water closets and wash-rooms are essentials not to be neglected.

Accidents.

In this district there were 37 accidents reported, the same as were reported in 1895. Of these five were fatal, one more than in 1895. Two of the fatal ones reported were by boiler explosions at the Michigan Salt Company, Marine City. Eleven of the accidents for the past year were at the Linton Manufacturing Company's plant, Saginaw, none of which were fatal. Most of the accidents reported could not have been avoided by further protection to machinery, many of them being by carelessness on the part of the person injured.

Remarks.

Much interesting data can be obtained by a study of these tables, a great deal of which is not enumerated in these deductions. The changes ordered and a history of the accidents as reported, which follow, will impart much interesting information.

CHANGES ORDERED DURING YEAR.

DISTRICT NO. 4.

[The number refers to the inspection number in table.]

No. 2.—Ordered guard around fly wheel on engine shaft.

No. 7.—Guard around driving wheel in basement ordered.

No. 9.—Ordered projecting screws and keys on printing presses guarded.

No. 17.—Ordered two children under 14 discharged.

No. 25.—Ordered one child under 14 discharged.

No. 30.—Ordered railing around driving pulley.

No. 31.—Ordered railing across landing on stairs leading to filing room.

No. 35.—Ordered statements placed on file with name and ages of all children employed under 16 years. (Complied with at once.—Insp.)

No. 43.—Ordered automatic gate on elevator; guard around fly-wheel on engine shaft, and dust collectors for entire factory.

No. 44.—Ordered one child under 14 discharged. This order was made early in the season when establishment was running.

No. 55.—Ordered bevel gears covered; exposed set screws removed, and box over belt which runs close to the floor in lower part of mill.

No. 58.—Ordered set screws removed from head end of line shaft; handrail on stairway; shifters on all machines, and guards on rip saw.

No. 60.—Guard around flywheel, and handrails on stairways ordered.

No. 62.—Ordered six children under 14 discharged.

No. 67.—Ordered guards on all rip saws, and over planer counter shaft.

No. 71.—Ordered one child under 14 discharged.

No. 72.—Automatic gates for elevator ordered.

No. 73.—Ordered fire escape on mill.

No. 79.—Ordered two rip saws provided with saw guards.

No. 97.—Guards for rip saws ordered.

No. 100.—Ordered shifters on all machines not supplied, and guards on rip saw.

No. 101.—Ordered shifters on all machines, and guards for all rip saws.

No. 119.—Ordered loose pulleys and shifters on all machines not already supplied, and guards for rip saws.

No. 121.—Guards for rip saws ordered.

No. 143.—Ordered three children under 14 discharged.

No. 161.—Ordered automatic gates for elevator; handrails on stairways, and separate closet for females.

No. 168.—Ordered statements placed on file for one boy under the age of 16 years.

No. 189.—Ordered guards for saws.

No. 197.—Ordered exhaust fans, and guards for saws.

No. 205.—Guards for rip saw ordered.

No. 207.—Ordered saw guards and shifters on all machnes.

No. 208.—Ordered shifters on all machines not so supplied.

No. 213.—Ordered handrail on stairway, and separate closet for females.

No. 216.—Ordered separate closet for females.

No. 273.—Ordered one child under 14 discharged.

No. 275.—Ordered shifter, and guards around flywheel and on saw.

No. 276.—Ordered shifters on planer and one child under 14 discharged.

No. 277.—Ordered two children under 14 discharged.

No. 283.—Ordered one child under 14 discharged.

No. 314.—Ordered guards for rip saw.

No. 320.—Ordered two children under 14 discharged. This order was made earlier in the season when the factory was running.

No. 322.—Ordered the bakery cleaned.

No. 324.—Ordered wash rooms provided.

No. 332.—Statements placed on file with name and ages of all children employed in factory A under 16 years ordered.

No. 338.—Ordered wash rooms in finishing rooms.

No. 349.—Ordered separate closet for females.

No. 358.—Ordered a guard for rip saw.

No. 359.—One child under 14 ordered discharged; also guards for rip saw ordered.

No. 364.—Handrails on stairways ordered.

No. 368.—Ordered automatic gates for elevator.

No. 378.—Ordered one child under 14 discharged.

No. 386.—Shifters and loose pulleys were ordered.

No. 390.—Ordered five children under 14 discharged; registers kept and statements on file for boys under 16; exhaust fans and piping for boring and turning lathes.

ACCIDENTS REPORTED DURING YEAR.

DISTRICT NO. 4.

[The number refers to the inspection number in table.]

No. 61.—Feb. 1, 1896. Thomas Johns, age 40, married, filer, in the employ of Saginaw Box Co., Saginaw, had the ends of three fingers cut off in cutting machine, through his own carelessness. Was disabled six weeks, and received no wages during time disabled. But the firm gave him some assistance.

No. 63.—Aug. 8, 1896. Paul Schram, age 21, single, machine hand, employed by Saginaw Basket Works, Saginaw, was cut across back from shoulder to hip, by weight falling from swing saw and letting the saw come forward. Was disabled two months. Firm paid wages in full, and all his expenses during time disabled.

No. 67.—March 20, 1896. John Bahner, age 20, single, machine hand, in the employ of Russell Bros. & Co., Salzburgh, cut off end of one finger by carelessness. Was disabled two weeks and received no wages during time disabled.

No. 67.—April 15, 1896.. Richard Jackson, age 26, single, machine hand, employed by Russell Bros. & Co., Salzburgh, lost one finger by sliver coming off board and letting hand slip on saw. Was disabled ten days, and did not receive wages while disabled.

No. 70.—April 23, 1896. Herman Meyer, age 36, married, machine hand, employed by D. Hardin & Co., Saginaw, in using cut-off saw, hand slipped from board and cut off part of little finger. Was disabled five days and received no wages during time disabled.

No. 101.—May 14, 1896. Bert DeLacey, age 20, single, machine hand, employed by Riverside Wood Co., Port Huron, lost one finger by carelessness. Was disabled six weeks, and received no wages during time disabled. The saw was not guarded according to orders.

No. 114.—June 11, 1896. John Haley, age 55, single, was killed by a boiler explosion at the Michigan Salt Co., Marine City. Burial expenses paid by family. He was not an employé of the firm.

No. 114.—June 11, 1896. William Mowbray, age 28, single, foreman, employed by Michigan Salt Co., Marine City, killed by a boiler explosion. Burial expenses paid by company.

No. 114.—June 11, 1896. Peter Booth, age 40, married, foreman, in the employ of Michigan Salt Co., Marine City, lost left arm by a boiler explosion. Was disabled two months, and received wages in full while disabled. Doctor's bill and other expenses paid by firm.

No. 114.—June 11, 1896. S. O'Neal, age 30, married, fireman, employed by Michigan Salt Co., Marine City, was badly scalded by a boiler explosion. Was disabled six weeks. Wages paid in full for time disabled, also doctor's bills and all expenses paid by company.

No. 147.—June 26, 1896. Joseph Wisnet, age 27, married, lumber piler, employed by Smalley & Woodworth, was killed; in making a mistep he fell from tramway. Burial expenses paid by family.

No. 163.—June 10, 1896. John McAuliff, age 35, married, greaser, employed by Holland, Emery Lumber Co., East Tawas, lost three fingers through carelessness. Was disabled four weeks and received no wages during time disabled.

No. 189.—Aug. 17, 1896. Howard Burton, age 16, employed as rivet heater by F. W. Wheeler & Co., West Bay City, was killed through carelessness. Two boys were scuffling on a scaffold thirty feet high, and both fell off. The other boy was slightly injured. Burial expenses paid by family.

No. 203.—Sept. 11, 1896. Charles Trier, age 18, machine hand, employed by Saginaw Mfg. Co., Saginaw, had arm and hand bruised by a weight falling. Was disabled two weeks, and received one-half wages during time disabled. Doctor's bill paid by insurance company.

No. 280.—May 22, 1896. Charles Lapinski, age 15, machine hand, in the employ of W. B. Mershon & Co., Carrollton, had two fingers bruised by carelessness. Was disabled six weeks, and received wages during time disabled. Doctor's bill paid by firm.

No. 280.—June 27, 1896. Arthur Bolster, age 20, single, employed by W. B. Mershon & Co., Carrollton, had one finger cut off on foot power machine. Was disabled four weeks, and received wages during time disabled. Doctor's bill paid by firm.

No. 280.—Aug. 22, 1896. John Turloff, age 16, laborer, in the employ of W. B. Mershon & Co., Carrollton, had leg below knee badly cut on planing machine. The machine was guarded, but he removed guard which was not necessary. He was sick ten weeks, and received wages in full during time he was unable to work. Hospital and doctor bills paid by firm.

No. 283.—May 19, 1896. John Babcock, age 24, single, employed by Saginaw Mfg. Co., Carrollton, lost part of little finger, through carelessness. Was disabled two months. He received one-half wages and doctor's bill paid by insurance company.

No. 283.—April 6, 1896. George Barker, age 35, married, employed by Saginaw Mfg. Co., Saginaw, had hand jammed and poisoned by glue. Was disabled two weeks. One-half wages and doctor's bill paid by insurance company.

No. 283.—June 1, 1896. Frank Duane, age 19, single, machine hand, employed by Saginaw Mfg. Co., Saginaw, was cut on wrist through carelessness. Was disabled ten days. One-half wages and doctor's bill paid by insurance company.

No. 283.—Sept. 22, 1896. Frank Merrow, age 30, married, wood turner, in the employ of Saginaw Mfg. Co., Saginaw, had hand crushed and finger broken, through carelessness. Was disabled three weeks. One-half wages and doctor's bill paid by insurance company.

No. 283.—June 10, 1896. Frank Merrow, age 30, married, woodturner, employed by Saginaw Mfg., Saginaw, had jaw fractured, through carelessness. Was disabled thirty days. One-half wages and doctor's bill paid by insurance company.

No. 283.—Sept. 29, 1896. William Bauer, age 22, single, machine hand, in the employ of Saginaw Mfg. Co., Saginaw, had hand cut on grooving saw. Was disabled five weeks. He received one-half wages and doctor's bill paid by insurance company.

No. 335.—Nov. 2, 1896. Floyd Collier, age 18, a laborer, in the employ of the Owosso Mfg. Co., at Owosso, was killed by a belt breaking and striking him. It was purely accidental and could not have been guarded against. His burial expenses were borne by his father.

No. 369.—August 15, 1896. Evans Westfall, age 21, single, an engineer, in the employ of W. A. Forbes & Co., Caro, had two fingers cut off through carelessness on his part. Was disabled four weeks and received no pay nor benefits during the time.

No. 378.—April, 1896. Adolph Muellerweiss, age 16, a laborer, employed by Sebawaing Mfg. Co., of Sebawaing, received a cut in the leg, by the breaking of a belt. Was disabled two weeks and received no pay nor benefits during that time. It was an accident which could not have been guarded against.

No. 386.—Feb. 1, 1896. A. Sonntag, age 16, employed on nailing machine, by the Linton Mfg. Co., at Saginaw, through carelessness, smashed fingers on left hand. Was disabled 25 days. Received one-half wages and doctor's bill paid by an insurance company during disability.

No. 386.—Feb. 11, 1896. Charles Carmel, age 50, married, employed at loading boxshooks on cars, for the Linton Mfg. Co., at Saginaw, by an over-lift or strain was injured internally. Was unable to work for 28 days and during that time received one-half wages and doctor's bill paid by an insurance company.

No. 386.—March 5, 1896. Ed. Melevea, age 30, married, employed as a fireman by the Linton Mfg. Co., at Saginaw, was scalded when handling a loose pipe on water column. Was disabled from work 12 days, during which time he he was paid one-half wages and doctor's bill by an insurance company.

No. 386.—March 12, 1896. H. Williams, aged 19, employed by the Linton Mfg. Co., at Saginaw, cutting box shooks on rip saw, cut off one joint of thumb on right hand. Was disabled 26 days and was paid one-half wages and doctor's bill during disability by an insurance company.

No. 386.—March 25, 1896. B. Richardson, age 18, employed by the Linton Mfg. Co., Saginaw, while cutting box shooks on rip saw, was disabled for 33 days by cutting off finger on left hand, blood poison setting in. Received one-half wages and doctor's bill paid by an insurance company during his disability.

No. 386.—April 3, 1896. William Holden, age 30, single, employed at cutting and grading box stuff for the Linton Mfg. Co., Saginaw, received a very bad cut in corner of right eye, by a piece of pine flying from another machine. Was disabled 14 days, during which time he was paid one-half wages and doctor's bill paid by an insurance company.

No. 386.—April 27, 1896. Joseph Beceit, age 50, married, employed as a fireman, by the Linton Mfg. Co., at Saginaw, was scalded by hand slipping from the blow-off pipe. Was disabled 17 days, during which time he received one-half wages and doctor's bill paid by an insurance company.

No. 386.—May 9, 1896. A. Lawson, age 18, employed at feeding a planer by the Linton Mfg. Co., at Saginaw, accidentally cut three fingers on left hand, which disabled him 67 days, during which time he was paid one-half wages and doctor's bill by an insurance company.

No. 386.—May 12, 1896. Charles Dibble, age 20, single, was employed by the Linton Mfg. Co., at Saginaw, at cutting box shooks and through carelessness clipped little finger on left hand. Was disabled 19 days, during which time he was paid one-half wages and doctor's bill paid by an insurance company.

No. 386.—May 20, 1896. F. Hutchinson, age 18, employed as a machine hand, by the Linton Mfg. Co., at Saginaw, cut middle and index finger on left hand, through carelessness. Was disabled 27 days. Received one-half wages and doctor's bill paid by an insurance company.

No. 386.—July 11, 1896. F. Fobear, age 55, married, a salt maker, employed by the Linton Mfg. Co., at Saginaw, slipped into a vat of hot brine and scalded foot. Was disabled 18 days. Was paid one-half wages and doctor's bill by an insurance company during disability.

FIFTH DISTRICT.

T. A. ELY, *Deputy Inspector.*

SUMMARY OF WORK IN FIFTH INSPECTION DISTRICT.

OFFICE OF DEPUTY FACTORY INSPECTOR,
Alma, Nov. 30, 1896.

HON. C. H. MORSE, *Commissioner of Labor, Lansing, Mich.:*

DEAR SIR—In compliance with your request of recent date, I respectfully submit the following report of my work as Deputy Factory Inspector for the past year.

From the commencement of my work in 1895, I have taken pains to meet proprietors and foreman, leaving copies of the law, and as a result the inspections this year have been very satisfactory, not a case of illegal employment of children having been found. There are no buildings in this district where people are employed above the second floor, and fire escapes are not necessary. Former orders for protection to stairs, belts and machinery have been complied with, and I have not found it necessary to serve written notices for the few minor changes required, a verbal request being readily complied with. I have inspected during the year three hundred and forty-two factories and shops, and revisited eighteen of the larger ones. Owing to the general depressed condition of business very many places are idle. Especially have I found this the case in the past two months. A great many others are only working a part of their usual force. Under changed conditions, with the factories all running to their full capacity there would be very much more for an inspector to do.

Yours very respectfully,

T. A. ELY,
Deputy Inspector.

Table showing factory inspection in fifth district since June 12, 1895.

Kind of changes ordered.	1895.		1896.	
	No. of changes ordered.	No. of orders complied with.	No. of changes ordered.	No. of orders complied with.
Complete system of dust arresters	1	1	0	0
Automatic gates for elevators	4	2	0	0
Separate closets	2	2	1	1
Blowers for sanders	3	.....	2	2
Children under 14 discharged	11	11	0	0
Registers ordered kept	13	13	3	3
Machinery and belts ordered guarded	17	17	14	14
Hand rails for stairs	9	9	3	3
Miscellaneous orders	......	.....	6	6
Whole number	60	55	29	29

Inspection book No. 1. **TABLE No. 5.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
1	Apr. 15	North Star	Sandusky Cooperage & Lum. Co.	Staves and heading	run.	full
2	" 15	"	North Star Brick & Tile Co.	Brick and tile	idle	......
3	" 16	Bannister	E. C. Bradford & Bros.	Staves and heading	run.	full
4	" 16	Ashley	Chittenden & Bracht	" "	"	"
5	" 17	Wheeler	Liken, Brown & Co.	" "	"	"
6	" 17	Breckenridge	Gardner & Peterman	" "	"	"
7	" 18	Riverdale	Gardner, Peterman & Co.	" "	"	"
8	" 20	St. Louis	St. Louis Hoop & Stave Co.	Hoops	"	"
9	" 20	"	T. W. Whitney	Hub blocks	"	"
10	" 20	"	M. J. Claggett & Co.	Staves and heading	"	"
11	" 20	"	Wm. H. H. Smith & Sons	Brick, tile & carri'g hubs	"	"
12	" 21	"	Edison Electric Light & Power Co	Electric light	"	"
13	" 21	"	St. Louis Independent	Printed matter	"	"
14	" 21	"	St. Louis Republican-Leader	" "	"	"
15	" 21	"	St. Louis Milling Co.	Flour and feed	"	"
16	" 21	"	Samuel Gordon	Sole leather	"	"
17	" 22	Six Lakes	A. H. McDonald	Lumber and shingles	"	"
18	" 23	Lakeview	Macomber & Bale	" lath & shingles	"	"
19	" 23	"	A. McAfee	Staves and heading	"	"
20	" 23	"	Stebbins Manufacturing Co.	Furniture and novelties	"	part
21	" 24	Howard City	Henry Hinkle	Butter tubs	"	full
22	" 24	"	Skinner & Steenman	Side boards	"	"
23	" 25	Morley	A. W. Dodge & Co.	Clothes pins	"	"
24	" 27	Greenville	Cowan, Booth & Crawford	Sash, doors and blinds	"	"
25	" 27	"	Greenville Planter Co.	Potato planters	"	"
26	" 27	"	R. J. Tower	Mill machinery	"	"
27	" 28	"	Wright Bros. & Co.	Flour and feed	"	"
28	" 28	"	Electric Light Co.	Electric light	"	"
29	" 28	"	Greenville Implement Co.	Farm implements	"	"
30	" 28	"	Coleman Bros.	Laundry work	"	"
31	" 28	"	E. Middleton & Sons	Flour and feed	"	"
32	" 29	"	H. A. Anderson & Sons	Dressed lumber	"	"
33	" 29	"	Ranney Refrigerator Co.	Refrigerators	"	"
34	May 1	Shepherd	A. W. Dodge & Co.	Clothes pins	"	"
35	" 1	"	Shepherd Stave & Heading W'ks	Staves and heading	"	"
36	" 2	Ithaca	C. W. Althouse	" "	"	"
37	" 2	"	W. F. Thompson	Butter tubs	"	"
38	" 2	"	Ithaca Milling Co.	Flour and feed	"	"
39	" 2	"	St. Johns Manufacturing Co.	Lumber	idle	......
40	" 12	St. Ignace	Jennison Lumber Co.	"	run.	full
41	" 12	"	St. Ignace Electric Light Co.	Electric light	"	"
42	" 13	White Dale	Robert Beeson	Shingles	idle	......
43	" 13	Hunt Spur	Michigan Cedar Co.	Lumber and shingles	run.	full
44	" 14	Thompson	Delta Lumber Co.	" lath, etc.	"	"
45	" 14	Manistique	Weston Manufacturing Co.	Sash, doors, etc.	"	"
46	" 14	"	Weston Furnace Co.	Pig iron	idle	......
47	" 14	"	Chicago Lumber Co.	Lumber, lath & shingles	run.	full
48	" 15	"	Hall & Buell	" and lath	"	"
49	" 15	"	White Marble Lime Co.	Lime and crushed stone	"	"
50	" 15	"	J. Pattinson	Laundry work	"	"

District No. 5. *T. A. Ely, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity.	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclos'd and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water-closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	46	37	----	$1,500	----	2	yes	10	60	----	----	----	yes	no	‡	yes	yes	yes	yes	----	----	1
60	..	9	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	2
60	60	35	17	----	400	----	----	----	10	60	----	----	----	yes	no	‡	yes	no	yes	yes	----	----	3
60	60	50	50	----	1,000	----	----	----	10	60	----	----	yes	"	"	‡	"	yes	"	"	----	----	4
60	60	25	8	----	600	----	----	----	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	5
60	60	30	23	----	900	----	3	yes	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	6
60	60	50	50	----	1,300	----	5	"	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	7
60	60	57	57	----	1,900	----	1	"	10	60	----	----	yes	"	"	‡	"	"	"	"	----	----	8
60	60	12	12	----	430	----	----	----	10	60	----	----	----	"	"	‡	"	"	----	"	----	----	9
60	60	50	25	----	1,000	----	----	----	10	60	----	----	----	"	"	‡	"	"	yes	"	----	----	10
60	60	12	12	----	300	----	----	----	10	60	----	----	----	"	"	‡	"	"	----	no	----	----	11
72	72	2	2	----	100	----	----	----	----	60	----	----	yes	"	"	‡	"	"	----	yes	----	----	12
60	60	6	6	----	200	----	----	----	10	60	----	----	----	"	"	‡	"	"	yes	"	----	----	13
60	60	4	4	----	140	----	----	----	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	14
60	60	6	4	----	240	----	----	----	10	60	----	----	yes	"	"	‡	"	"	----	"	----	----	15
60	60	4	2	----	80	----	----	----	10	60	----	----	----	"	"	‡	----	"	yes	"	----	----	16
66	66	28	15	----	500	----	----	----	10	60	----	----	----	"	"	‡	yes	"	"	"	----	----	17
66	66	40	40	----	1,500	----	----	----	10	60	yes	----	yes	"	"	‡	"	"	"	"	----	----	18
60	60	35	35	----	800	----	1	yes	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	19
60	48	26	17	----	375	----	----	----	10	60	----	†	yes	"	"	‡	"	"	"	"	----	1	20
60	60	20	20	----	500	----	----	----	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	21
60	60	150	150	----	4,000	----	----	----	10	60	----	----	yes	"	"	‡	"	"	"	"	----	----	22
60	60	16	10	6	430	----	----	----	10	60	----	----	"	"	"	‡	"	"	"	"	yes	----	23
60	60	5	3	----	125	----	----	----	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	24
60	60	5	3	----	175	----	----	----	10	60	----	----	yes	"	"	‡	"	"	"	"	----	----	25
60	60	12	7	----	300	----	----	----	10	60	----	----	"	"	"	‡	"	"	"	"	----	----	26
60	60	6	4	----	300	----	----	----	10	60	----	----	"	"	"	‡	"	"	"	"	----	----	27
72	72	2	2	----	110	----	----	----	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	28
60	60	26	10	----	600	----	----	----	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	29
60	60	3	2	1	95	----	----	----	10	60	----	----	----	"	"	‡	----	"	"	"	yes	----	30
60	60	11	11	----	700	----	----	----	10	60	----	----	yes	"	"	‡	yes	"	"	"	----	----	31
60	60	8	4	----	120	----	----	----	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	32
60	60	120	120	----	3,600	----	----	----	10	60	yes	yes	yes	"	"	‡	"	"	"	"	----	----	33
60	60	15	9	6	400	----	----	----	10	60	----	----	"	"	"	‡	"	"	"	"	yes	----	34
60	60	40	19	----	300	----	----	----	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	35
60	60	60	40	----	1,600	----	----	----	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	36
60	60	50	50	----	1,400	----	----	----	10	60	----	----	yes	"	"	‡	"	"	"	"	----	----	37
60	60	5	5	----	260	----	----	----	10	60	yes	----	"	"	"	‡	"	"	"	"	----	----	38
60	..	20	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	39
60	60	40	40	----	1,200	----	----	----	10	60	----	----	yes	yes	no	‡	yes	yes	yes	yes	----	----	40
72	72	2	2	----	75	----	----	----	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	41
60	..	15	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	42
60	60	80	80	----	**	----	----	----	10	60	----	----	yes	yes	no	‡	yes	yes	yes	yes	----	----	43
60	*	420	420	----	18,000	----	----	----	10	60	yes	----	"	"	"	‡	"	"	"	"	----	----	44
66	66	70	40	----	1,800	----	----	----	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	45
66	..	50	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	46
66	66	1000	1000	----	27,000	----	----	----	10	60	----	----	----	yes	no	‡	yes	yes	yes	yes	----	----	47
60	60	150	150	----	6,000	----	----	----	10	60	yes	----	yes	"	"	‡	"	"	"	"	----	----	48
66	66	45	20	----	1,000	----	----	----	10	60	"	----	"	"	"	‡	----	"	----	"	----	----	49
60	60	7	3	3	150	----	----	----	10	60	----	----	----	"	"	‡	yes	"	yes	"	no	----	50

* 120 hours-running over-time. † Yes-gates need repairing. ‡ None required.

** Pay roll not given.

Inspection book No. 2. **TABLE No. 5.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
51	May	16	Cook's Mills	Cook's Mill	Lumber	idle	......
52	"	16	Gladstone	Buckeye Stave Co.	Hoops	run.	full
53	"	16	"	Ely Dowel Works	Dowels & mouldings	"	"
54	"	16	"	Gladstone Electric Light Co.	Electric light	"	"
55	"	16	"	Davis & Mason	Lumber, lath & shingles	"	"
56	"	18	"	Cleveland Cliffs Iron Co.	Pig iron & wood alcohol	"	"
57	"	18	Masonville	Naugle, Holcomb & Co.	Shingles & paving b'lks	"	"
58	"	18	Rapid River	Fred W. Gray & Co.	" posts and ties	"	"
59	"	18	Garth	Garth Lumber Co.	Lumber, lath & shingles	"	"
60	"	19	Escanaba	Escanaba Brewing Co.	Beer	"	"
61	"	19	"	Escanaba Handle & Lumber Co.	Broom handles & lumb.	idle	......
62	"	19	"	Escanaba Iron Works	Mill & mining machinery	run.	full
63	"	19	"	Escanaba Steam Laundry	Laundry work	"	"
64	"	19	"	Escanaba Lighting Co.	Electric light	"	"
65	"	19	"	The I. Stephenson Co.	Dressed lumber	"	"
66	"	20	"	Ewing Bros.	Boilers & sh't iron tanks	"	"
67	"	20	"	Henry Wagon Works	Wagons, carriages, etc.	"	"
68	"	20	"	Escanaba Mirror	Printed matter	"	"
69	"	20	"	Iron Port	" "	"	"
70	"	20	"	Escanaba Journal	" "	"	"
71	"	20	"	Chicago & Northwestern R. R.	Car repairs	"	part
72	"	21	Wells	The I. Stephenson Co.	Lumber, lath & shingles	"	full
73	"	21	Ford River	Ford River Lumber Co.	" " " "	"	"
74	"	22	Menominee	Harding Bros.	Shingles	idle	......
75	"	23	"	Menominee River Shingle C.	"	"	......
76	"	22	"	Blodgett & Davis	Lumber, lath & shingles	"	......
77	"	23	"	The Kirby Carpenter Co.	" " " "	run.	full
78	"	23	"	Ludington, Wells & Van Shaick Co.	" " " "	"	"
79	"	25	"	Ramsey & Jones	"	"	"
80	"	25	"	Henry Swart	" lath & shingles	"	"
81	"	25	"	Donovan & O'Connor	" " " "	"	"
82	"	26	"	Menominee Bay Shore Lumb. Co.	" " " "	"	"
83	"	26	"	Girard Lumber Co.	" " " "	"	"
84	"	26	"	A. Spies	" " " "	"	"
85	"	26	"	Kenyon Lumber Co.	Sash and door stock	"	"
86	"	27	"	Menominee Stained Glass Works	Stained glass	"	"
87	"	27	"	Leisen & Henes	Beer	"	"
88	"	27	"	Menominee River Brewing Co.	"	"	"
89	"	27	"	Menominee & Marinette Paper Co.	Paper	"	"
90	"	27	"	Crawford Manufacturing Co.	Boxes	"	"
91	"	28	"	Menominee Sash & Door Co.	Sash and doors	"	"
92	"	28	"	A. W. Clark & Co.	Match blocks & shingles	"	"
93	"	28	"	Menominee Iron Works	Mill & min'g machinery	"	"
94	"	28	"	Menominee Electric & Mech'l Co.	Electrical goods	"	"
95	"	28	"	Menominee Boiler works	Boilers	"	"
96	"	28	"	Hubbard Saw & Tool Co.	Saws	"	"
97	"	29	"	Ellis Laundry	Laundry work	"	"
98	"	29	"	Hanes Laundry	" "	"	"
99	"	29	"	H. P. Schmidt	Baked goods	"	"
100	"	29	"	Electric Light & Power Co.	Electric light & power	"	"

District No. 5. *T. A. Ely, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. h'rs males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	--	10	----	----	------	----	----	------	----	----	----	----		---	----		----	---	----	---	----	----	51
60	60	80	55	----	$2,500	---	8	yes	10	60	----	----	no	yes	no	‖	yes	yes	yes	yes	----	----	52
60	60	10	10	----	800	----	----	------	10	60	----	----	"	"	"	‖	"	"	"	"	----	----	53
60	60	8	8	----	------	----	----	------	10	60	---	---	----	"	"	‖	"	"	"	"	----	----	54
60	60	100	100	----	4,[illegible]00	----	----	------	10	60	----	----	yes	"	"	‖	"	"	"	"	----	----	55
*	*	85	85	----	4,500	----	----	------	----	60	yes	yes	"	"	"	‖	"	"	"	"	---	----	56
60	60	100	40	----	1,600	----	----	------	10	60	"	----	"	"	"	‖	"	"	"	"	----	----	57
66	66	100	100	----	4,000	----	----	------	----	60	"	----	"	"	"	‖	"	"	"	"	----	----	58
†	†	160	160	----	6,800	----	----	------	10	60	"	----	"	"	"	‖	"	"	"	"	----	----	59
66	66	9	9	----	580	----	----	------	----	60	"	----	"	"	"	‖	----	"	"	"	----	----	60
60	--	60	----	----	------	----	----	------	----	----	----	----	---	----	----	---	---	----	----	----	---	----	61
60	60	18	18	----	600	----	----	------	10	60	yes	----	yes	yes	no	‖	yes	yes	yes	yes	----	----	62
60	60	7	3	4	350	----	----	------	10	60	----	----	----	"	"	‖	"	"	"	"	yes	----	63
60	60	6	6	----	300	----	----	------	10	60	----	----	----	"	"	‖	"	"	"	"	----	----	64
60	60	9	9	----	450	----	----	------	10	60	----	----	----	"	"	‖	"	"	"	"	----	----	65
60	60	5	3	----	200	----	----	------	10	60	----	----	----	"	"	‖	"	"	"	"	----	----	66
60	60	7	4	----	200	----	----	------	10	60	----	----	----	"	"	‖	"	"	"	"	---	----	67
60	60	10	7	3	250	----	----	------	10	60	----	----	----	"	"	‖	"	"	"	"	yes	----	68
60	60	6	4	2	200	----	----	------	10	60	----	----	----	"	"	‖	"	"	"	"	"	----	69
60	60	4	2	2	------	----	----	------	10	60	----	----	----	"	"	‖	"	"	"	"	"	----	70
60	54	300	259	----	14,700	----	----	------	10	60	yes	----	yes	"	"	‖	"	"	"	"	----	----	71
60	60	----	160	----	5,000	----	---	------	10	60	----	----	"	"	"	‖	"	"	"	"	----	----	72
60	60	420	420	----	12,000	----	---	------	10	60	yes	----	"	"	"	‖	"	"	"	"	----	----	73
60	--	18	----	----	------	----	----	------	--	---	----	----	---	----	----	----	----	----	----	----	----	----	74
60	--	50	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	75
60	--	150	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	76
60	60	500	500	----	25,000	----	----	------	10	60	yes	----	yes	yes	no	‖	yes	yes	yes	yes	---	----	77
60	60	350	350	----	15,000	----	----	------	10	60	"	----	"	"	"	‖	"	"	"	"	----	----	78
60	†	100	100	----	4,000	----	----	------	10	60	"	----	"	"	"	‖	"	"	"	"	----	----	79
60	60	75	75	----	3,100	----	----	------	10	60	"	----	"	"	"	‖	"	"	"	"	---	----	80
60	†	100	100	----	4,200	----	----	------	10	60	"	----	"	"	"	‖	"	"	"	"	----	----	81
60	60	110	110	----	4,800	----	----	------	10	60	"	----	"	"	"	‖	"	"	"	"	---	----	82
60	60	120	120	---	5,000	----	----	------	10	60	"	----	"	"	"	‖	"	"	"	"	----	----	83
60	60	75	75	----	3,000	----	----	------	10	60	"	----	"	"	"	‖	"	"	"	"	----	----	84
60	60	80	22	----	550	----	4	yes	10	60	----	----	----	"	"	‖	"	"	"	"	----	----	85
60	60	12	2	----	150	----	----	------	10	60	----	----	yes	"	"	‖	"	"	"	"	----	----	86
60	60	27	27	----	1,300	----	----	------	10	60	yes	yes	"	"	"	‖	"	"	"	"	---	----	87
60	60	28	28	----	1,400	----	----	------	10	60	"	"	"	"	"	‖	"	"	"	"	----	---	88
*	*	44	44	----	1,700	----	2	no	8	60	"	----	"	"	"	‖	"	"	"	"	----	----	89
60	60	22	22	----	------	----	2	"	10	60	----	----	----	"	"	‖	----	----	----	"	---	----	90
60	60	40	29	----	1,000	----	----	------	10	60	----	----	yes	"	"	‖	yes	yes	no	"	----	---	91
60	60	110	110	----	2,800	----	12	yes	10	60	----	----	----	"	"	‖	"	"	yes	"	----	----	92
60	60	35	25	----	1,500	----	----	------	10	60	----	----	----	"	"	‖	"	"	"	"	----	----	93
60	60	20	14	----	700	----	----	------	10	60	----	----	----	"	"	‖	"	"	"	"	---	----	94
60	60	25	15	----	750	----	---	------	10	60	----	----	----	"	"	‖	"	"	"	"	---	----	95
60	60	15	15	----	750	---	----	------	10	60	----	----	yes	"	"	‖	"	"	"	"	----	----	96
60	60	6	1	5	§	----	----	------	10	60	----	----	----	"	"	‖	"	"	"	"	yes	----	97
60	60	8	3	5	175	----	----	------	10	60	----	----	----	"	"	‖	"	"	"	"	"	----	98
60	60	5	3	----	120	----	----	------	10	60	----	----	----	"	"	‖	----	----	----	"	---	----	99
*	*	7	7	----	400	----	----	------	----	60	----	----	----	"	"	‖	yes	yes	yes	"	----	---	100

* 144 hours—running day and night.
† 120 hours.
§ Refused to give pay roll.
‖ None required.

Inspection book No. 3.

TABLE No. 5.—Continued.—

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
101	June 8	Mt. Pleasant	Mt. Pleasant Lumber Co.	Lumber	run.	full
102	" 8	"	Mt. Pleasant Manufacturing Co.	Screen doors	"	"
103	" 8	"	Wm. Bamber	Apiarian supplies	"	"
104	" 8	"	Mt. Pleasant Roller Mills	Flour and feed	"	"
105	" 8	"	L. Shafer	Shingles	"	"
106	" 10	Newberry	Newberry Furnace Co.	Pig iron and charcoal	idle	......
107	" 10	Dollarville	Dollarville Lumber Co.	Lumber, lath & pickets.	run.	full
108	" 12	Munising	Geo. L. Burtis	" " shingles	"	"
109	" 12	"	Sutherland, Innis & Co.	"	"	"
110	" 12	"	Sutherland, Innis & Co.	Staves and hoops	idle	......
111	" 13	Marquette	Dead River Mill Co.	Lumber, lath & shingles	run.	full
112	" 13	"	Bice Manufacturing Co.	Sash, doors and blinds	"	"
113	" 13	"	Upper Peninsular Brewing Co.	Beer	"	"
114	" 13	"	Marquette Valley Mills	Flour and feed	"	"
115	" 15	"	Lake Shore Iron Works	Mill & mining machin'y	"	"
116	" 15	"	Bice Manufacturing Co.	Lumber	idle	......
117	" 15	"	Portage Entry Quarry Co.	Building stone	run.	full
118	" 15	"	Marquette Mining Journal	Printed matter	"	"
119	" 15	"	D. S. S. & A. R. R.	Car repairs	"	"
120	" 16	"	Marquette Steam Laundry	Laundry work	"	"
121	" 16	"	Lake Superior Knit Goods Works	Knit goods	"	"
122	" 16	"	Lake Superior Carriage Works	Carriages and sleighs	"	"
123	" 16	"	Hanck & Deckelmann	Cigars	"	"
124	" 17	Ishpeming	Jaedecke Bros.	"	"	"
125	" 17	"	Excelsior Furnace Co.	Pig iron	"	"
126	" 17	"	Ishpeming Steam Laundry	Laundry work	"	"
127	" 17	"	Iron Ore	Printed matter	"	"
128	" 17	"	Peninsular Record	" "	"	"
129	" 18	Negaunee	Johnson Lumber Co.	Lumber	"	"
130	" 18	Eagle Mills	F. W. Read & Co.	" sash and doors.	"	"
131	" 18	Michigamme	F. W. Read & Co.	" lath & shingles	"	"
132	" 19	Houghton	James Pryor & Sons	"	"	"
133	" 19	"	Houghton Electric Light Co.	Electric light	"	"
134	" 19	"	Twin City Steam Laundry	Laundry work	"	"
135	" 19	"	Lake Superior Soap Co.	Soap	"	"
136	" 19	Hancock	M. M. Moralee	Lumber and shingles	"	"
137	" 19	"	Lake Superior Boiler Works	Boilers	"	"
138	" 20	"	C.J.Hodge L'ke Super'r Iron W'ks	Mining machinery	"	"
139	" 20	"	Portage Lake Foundry & Machine Works.	" "	"	"
140	" 20	Calumet	N. S. Bray	Dressed lumber	"	"
141	" 20	Gregoryville.	Joseph Gregorie	Lumber, sash and doors	"	"
142	" 22	Chassell	Sturgeon River Lumber Co.	" lath & shingles	"	"
143	" 22	"	Cory Shingle Co.	Shingles	"	"
144	" 23	Baraga	Estate of Thos. Nester	Lumber, lath & shingles	"	"
145	" 23	Pequaming	Chas. Hibbard & Son	" " "	"	"
146	" 22	Baraga	John Funke	Lumber	"	"
147	" 23	L'Anse	L'Anse Brown Stone Co.	Building stone	"	"
148	" 23	"	L'Anse Pressed Brick Co.	Brick	"	"
149	" 24	Ontonagon	Diamond Match Co.	Lumber	"	"
150	" 24	"	Diamond Match Co.	Boxes	idle	......

District No. 5. *T. A. Ely, Deputy Inspector*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	40	40	----	$1,400	----	----	------	10	60	----	----	yes	yes	no	§	yes	yes	yes	yes	----	----	101
60	60	10	7	----	250	----	----	------	10	60	----	----	----	"	"	§	"	"	‖	"	----	----	102
60	60	10	4	----	200	----	----	------	10	60	----	----	----	"	"	§	"	"	yes	"	----	----	103
60	60	6	6	----	800	----	----	------	10	60	yes	----	yes	"	"	§	"	"	"	"	----	----	104
60	60	10	10	----	800	----	----	------	10	60	----	----	"	"	"	§	"	"	"	"	----	----	105
60	--	350	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	106
60	60	130	130	----	6,000	----	----	------	10	60	yes	----	yes	yes	no	§	yes	yes	yes	yes	----	----	107
60	60	100	60	----	4,000	----	----	------	10	60	----	----	"	"	"	§	"	"	"	"	----	----	108
60	60	100	50	----	‡	----	----	------	10	60	----	----	"	"	"	§	"	"	"	"	----	----	109
60	--	60	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	110
60	60	175	175	----	7,500	----	----	------	10	60	----	----	yes	yes	no	§	yes	yes	yes	yes	----	----	111
60	60	65	14	----	1,500	----	----	------	10	60	----	----	"	"	"	§	"	"	"	"	----	----	112
*	*	16	16	----	800	----	----	------	10	60	yes	yes	"	"	"	§	"	"	"	"	----	----	113
60	60	4	4	----	170	----	----	------	10	60	----	----	"	"	"	§	"	"	"	"	----	----	114
60	60	46	46	----	2,100	----	----	------	10	60	yes	----	"	"	"	§	"	"	"	"	----	----	115
60	--	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	116
60	60	85	85	----	1,400	----	----	------	10	60	yes	----	----	yes	no	§	yes	yes	yes	yes	----	1	117
60	60	30	28	2	‡	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	yes	----	118
60	60	200	200	----	12,326	----	----	------	10	60	yes	----	yes	"	"	§	"	"	"	"	----	----	119
60	60	13	3	10	300	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	yes	----	120
60	60	21	2	19	500	----	----	------	10	60	----	----	yes	"	"	§	"	"	"	"	"	----	121
60	60	18	8	----	120	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	----	----	122
48	48	8	6	----	250	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	----	----	123
48	48	12	12	----	400	----	----	------	10	60	----	----	yes	"	"	§	"	"	"	"	----	----	124
*	*	40	40	----	2,000	----	----	------	----	60	yes	----	"	"	"	§	"	"	"	"	----	----	125
60	60	12	2	10	280	----	----	------	10	60	"	----	----	"	"	§	"	"	"	"	yes	----	126
60	60	7	7	----	370	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	----	----	127
60	60	5	3	2	150	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	yes	----	128
60	60	25	25	----	500	----	----	------	10	60	----	----	yes	"	"	§	"	"	"	"	----	----	129
60	60	50	50	----	2,200	----	----	------	10	60	----	----	"	"	"	§	"	"	"	"	----	----	130
60	60	104	104	----	4,000	----	----	------	10	60	----	----	"	"	"	§	"	"	"	"	----	----	131
60	60	20	20	----	800	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	----	----	132
60	60	8	8	----	350	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	----	----	133
60	60	11	3	8	330	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	yes	----	134
60	60	6	4	----	175	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	----	----	135
60	60	45	45	----	2,000	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	----	----	136
60	60	15	15	----	750	----	----	------	10	60	yes	----	----	"	"	§	"	"	"	"	----	----	137
60	60	90	75	----	3,500	----	----	------	10	60	"	----	yes	"	"	§	"	"	"	"	----	----	138
60	60	35	20	----	2,000	----	----	------	10	60	"	----	"	"	"	§	"	"	"	"	----	----	139
60	60	6	6	----	300	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	----	----	140
60	60	75	75	----	2,000	----	----	------	10	60	----	yes	yes	"	"	§	"	"	"	"	----	----	141
63	†	144	144	----	7,700	----	2	yes	10	60	----	----	"	"	"	§	"	"	"	"	----	----	142
60	60	15	15	----	725	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	----	----	143
66	66	200	200	----	7,000	----	----	------	10	60	----	----	yes	"	"	§	"	"	"	"	----	----	144
60	60	225	225	----	9,500	----	----	------	10	60	yes	----	"	"	"	§	"	"	"	"	----	----	145
66	66	40	40	----	1,800	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	----	----	146
60	60	40	40	----	1,500	----	----	------	10	60	yes	----	----	"	"	§	"	"	"	"	----	----	147
60	60	12	12	----	500	----	----	------	10	60	----	----	----	"	"	§	"	"	"	"	----	- -	148
60	60	300	300	----	‡	----	----	------	10	60	----	----	yes	"	"	§	"	"	"	"	----	----	149
60	--	100	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	150

* 144 hours—running day and night.
† 126 hours—running over-time.
‡ No pay roll given.

§ None required.
‖ Yes—blowers need repairing.

Inspection book No. 4. **TABLE No. 5.—Continued.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold?	Running or idle?	If running, is it full or part time?
151	June 24	Hubbell's Mill	J. Hubbell	Lumber	idle	......
152	" 25	Sidnaw	J. H. Booth & Co.	"	run.	full
153	" 25	"	Corbin & Mead	Dressed lumber	"	"
154	" 25	Kenton	Sparrow-Kroll Lumber Co.	Lumber, lath & shingles	"	"
155	" 25	Trout Creek	Trout Creek Lumber Co.	" " "	"	"
156	" 26	Ewen	Ewen Planing Mill Co.	Dressed lumber	"	"
157	" 26	"	John McRae & Co.	Shingles and heading	"	"
158	" 26	"	Clark, Farnam & Co.	Lumber	idle	......
159	" 26	"	Phœnix Lumber Co.	"	"	......
160	" 27	Ironwood	Chas. H. Kneoig	Heading	"	......
161	" 27	"	Gogebic Hardwood Lumber Co.	Lumber, staves, etc.	"	......
162	" 27	"	Twin City Iron Works	Mill & mining machin'y	run.	full
163	" 27	"	Twin City Electric Light Co.	Electric light	"	"
164	" 29	"	Ironwood Lumber Co.	Lumber, lath & shingles	"	"
165	" 29	Bessemer	Bessemer Mfg. Co.	Heading	idle	......
166	" 30	Choate	Oshkosh Lumber Co.	Lumber, lath & shingles	"	......
167	" 30	Interior	Interior Lumber Co.	" " "	"	......
168	" 30	Robbins	Brown & Robbins	" " "	"	......
169	July 1	Crozier	Kern & Woodman	" " "	run.	full
170	" 1	Atkinson	Metropolitan Lumber Co.	" " "	"	"
171	" 2	Sagola	Sagola Lumber Co.	" " "	"	"
172	" 2	I'n Mountain	Eagle Laundry	Laundry work	"	"
173	" 2	"	Needham & Evans	Wagons, sleighs, etc.	"	"
174	" 3	Hermansville	Wisconsin Lumber Co.	Lumber, lath & shingles	"	"
175	" 3	Talbot	Talbot Lumber Co.	" " "	"	"
176	" 27	Riverdale	J. W. Robinson	"	idle	......
177	" 27	Vestaburg	J. W. Robinson	" and shingles	"	......
178	" 28	Bundy	Gale Lumber Co.	" and lath	run.	full
179	" 29	Weidman	John S. Weidman	" "	"	"
180	" 29	"	Adams & Acker	Shingles	"	"
181	" 30	Barryton	Plato, Renwick & Co.	Lumber and lath	"	"
182	" 30	"	Kemp Bros.	Dressed lumber	"	"
183	" 31	Winchester	Mecosta Lumber Co.	Lumber and lath	"	"
184	" 31	Hughes	F. W. Hughes	"	idle	......
185	" 31	Maynard's C'g	L. C. Beghold	"	"	......
186	Aug. 1	Chip'wa Lake	John D. Williams	"	run.	full
187	" 1	"	James Moore	Shingles	"	"
188	" 11	Petoskey	W. L. McManus	Lumber	idle	......
189	" 11	"	W. L. McManus	Dressed lumber	run.	full
190	" 11	"	White Swan Steam Laundry	Laundry work	"	"
191	" 11	"	American Laundry	" "	"	"
192	" 12	"	Petoskey Iron Works	Machinery	"	"
193	" 12	"	Burnett Foundry & Machine W'ks	"	"	"
194	" 12	"	W. A. Blakely	Dressed lumber	"	"
195	" 12	"	Petoskey Furniture Co.	Furniture	idle	......
196	" 13	"	Bull, Bauerle & Jones	Woodenware	run.	full
197	" 13	"	Birkett Bros.	" and chairs	"	"
198	" 13	"	Cable Mills	Flour and feed	"	"
199	" 14	"	Edison Petoskey Elec. Light Co.	Electric light	"	"
200	" 14	"	L. G. Grimes	Brick	idle	......

District No. 5. *T. A. Ely, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	--	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	151
66	*	60	60	----	$2,600	----	----	------	10	60	----	----	no	yes	no	§	yes	yes	yes	yes	----	----	152
60	60	50	8	----	600	----	----	------	10	60	----	----	yes	“	“	§	“	“	“	“	----	1	153
66	†	100	100	----	5,000	----	----	------	10	60	----	----	“	“	“	§	“	“	“	“	----	----	154
66	66	225	225	----	7,500	----	----	------	----	60	----	----	“	“	“	§	“	“	“	“	----	----	155
66	66	15	6	----	240	----	----	------	10	60	----	----		“	“	§	“	“	“	“	----	----	156
66	66	30	20	----	700	----	----	------	10	60	----	----	----	“	“	§	“	“	“	“	----	----	157
66	--	60	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	158
66	--	120	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	159
60	--	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	160
60	--	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	161
60	60	15	4	----	250	--	----	------	10	60	----	----	----	yes	no	§	yes	yes	yes	yes	----	----	162
‡	‡	6	6	----	------	----	----	------	----	60	----	----	----	“	“	§	“	“	“	“	----	----	163
60	60	45	45	----	1,800	----	----	------	10	60	----	----	yes	“	“	§	“	“	“	“	----	----	164
60	--	80	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	165
66	--	180	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	166
66	--	200	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	167
66	--	80	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	168
66	66	80	80	----	3,250	----	----	------	----	60	----	----	yes	yes	no	§	yes	yes	yes	yes	----	----	169
60	60	200	200	----	9,500	----	----	------	10	60	----	----	“	“	“	§	“	“	“	“	----	----	170
60	60	70	70	----	2,900	----	----	------	10	60	----	----	“	“	“	§	“	“	“	“	----	----	171
60	60	4	----	4	90	----	----	------	10	60	----	----	----	“	“	§	“	“	“	“	yes	----	172
60	60	6	5	----	300	----	----	------	10	60	----	----	yes	“	“	§	----	--	----	“	----	----	173
60	60	200	200	----	8,500	----	----	------	10	60	yes	yes	“	“	“	§	yes	yes	yes	“	----	----	174
60	60	40	40	----	1,600	----	----	------	10	60	----	----	“	“	“	§	“	“	“	“	----	----	175
60	--	22	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	176
60	--	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	177
66	66	160	100	----	5,000	----	----	------	10	60	----	----	yes	yes	no	§	yes	yes	yes	yes	----	----	178
66	66	125	115	----	3,200	----	----	------	10	60	----	----	“	“	“	§	“	“	“	“	----	----	179
66	66	13	13	----	400	----	----	------	10	60	----	----	----	“	“	§	“	“	“	“	----	----	180
66	66	50	50	----	1,700	----	----	------	10	60	----	----	yes	“	“	§	“	“	“	“	----	----	181
66	66	9	9	----	275	----	----	------	10	60	----	----	“	“	“	§	“	“	“	“	----	----	182
66	66	40	40	----	1,500	----	----	------	10	60	----	----	“	“	“	§	“	“	“	“	----	----	183
66	--	30	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	184
66	--	14	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	185
66	66	35	35	----	1,200	----	----	------	10	60	----	----	yes	yes	no	§	yes	yes	yes	yes	----	----	186
66	66	12	12	----	360	----	----	------	10	60	----	----	----	“	“	§	“	“	“	“	----	----	187
60	--	35	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	188
60	60	10	5	----	300	----	----	------	10	60	----	----	yes	yes	no	§	yes	yes	yes	yes	----	1	189
60	60	40	2	38	400	----	----	------	10	60	----	----	----	“	“	§	“	“	“	“	yes	----	190
60	60	7	2	5	175	----	----	------	10	60	----	----	----	“	“	§	“	“	“	“	----	----	191
60	60	6	4	----	200	----	----	------	10	60	----	----	----	“	“	§	“	“	“	“	----	----	192
60	60	8	4	----	225	----	----	------	10	60	----	----	----	“	“	§	“	“	“	“	----	----	193
60	60	7	6	----	180	----	----	------	10	60	----	----	----	“	“	§	“	“	“	“	----	----	194
60	--	80	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	195
60	60	15	8	----	240	----	----	------	10	60	----	yes	yes	yes	no	§	yes	yes	yes	yes	----	----	196
60	60	12	5	----	150	----	----	------	10	60	----	----	“	“	“	§	“	“	“	“	----	----	197
60	60	4	4	----	150	----	----	------	10	60	----	----	“	“	“	§	“	“	“	“	----	----	198
60	60	4	4	----	------	----	----	------	10	60	----	----	----	“	“	§	“	“	“	“	----	----	199
60	--	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	200

* 132 hours-running overtime.
† 144 hours-running overtime.
‡ 144 hours-running day and night.

§ None required.

Inspection book No. 5. **TABLE No. 5.—Continued.—**

No. given factory for 1896.	Date of inspection.	Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
201	Aug. 14	Petoskey	Forman & Curtis	Maple flooring	run.	full
202	“ 14	“	Winsor Woodenware Co.	Woodenware	idle	......
203	“ 15	“	James Buckley	Broom handles	“	......
204	“ 15	“	W. W. Rice Leather Co.	Sole leather	run.	full
205	“ 15	“	Petoskey Record	Printed matter	“	“
206	“ 15	“	Petoskey Independent Democrat	“ “	“	“
207	“ 17	Boyne City	W. H. White & Co.	Lumber	“	“
208	“ 17	“	A. Boyne	“	idle	......
209	“ 17	“	Boyne City Lumber Co.	“	“	......
210	“ 17	Advance	Godfrey Van Platen	“	run.	full
211	“ 19	S'lt Ste. Marie	Gray Shingle Co.	Shingles	idle	......
212	“ 19	“	Soo Mill Lumber Co.	Lumber	run.	full
213	“ 19	“	C. E. Ainsworth	“	“	“
214	“ 20	“	Edison Soo Electric Light Co.	Electric light	“	“
215	“ 20	“	Soo Steam Laundry	Laundry work	“	“
216	“ 20	“	Troy Steam Laundry	“ “	“	“
217	“ 20	“	Soo News	Printed matter	“	“
218	“ 21	“	Strachan Machine Works	Machinery	“	“
219	“ 21	“	Hickler Bros.	“	“	“
220	“ 21	“	Shaw & Tymon	Dressed lumber	“	“
221	“ 22	“	J. B. Sweatt	“ “ etc.	“	“
222	“ 22	Bay Mills	Niagara Paper Co.	Pulp wood	“	“
223	“ 22	“	The Hall & Munson Co.	Lumber, sash, etc.	“	“
224	“ 24	Alanson	L. C. Whittier	Shingles	“	“
225	“ 24	“	Alanson Manufacturing Co.	Lumber & veneer stock	“	“
226	“ 24	“	DeForrest & Co.	Wooden bowls	“	“
227	“ 24	“	George Sinclair Co.	Lumber	idle	......
228	“ 25	Levering	M. Palmer	“	“	......
229	“ 25	Brutus	Hinkley Bros.	Staves	run.	full
230	“ 25	Conway	Austin & Thompson	Shingles	idle	......
231	“ 25	“	McFarlan Bros.	Lumber	“	......
232	“ 26	Charlevoix	Charlevoix Lumber Co.	“	run.	full
233	“ 26	“	Francis & Burns	Dressed lumber	idle	......
234	“ 26	“	G. G. Williams	Wooden bowls	run.	full
235	“ 26	“	D. M. Ferry & Co.	Sorted seeds	“	“
236	“ 26	“	Cram & Whitford	Lumber	“	“
237	“ 27	H'bor Springs	Carey Hoop Co.	Hoops	idle	......
238	“ 27	“	A. G. Williams	Woodenware	“	......
239	“ 27	“	E. Shay & Son	Machinery	run.	full
240	“ 27	“	Thomas Kneal	Lumber	“	“
241	“ 28	Clarion	Buckley & Peterson	Handles and chair stock	idle	......
242	“ 28	Boyne Falls	W. H. White & Co.	Lumber	“	......
243	Sept. 15	Traverse City	The Oval Wood Dish Co.	“ & woodenware	run.	full
244	“ 15	“	Wells, Higman & Co.	Basket & fruit packages	“	“
245	“ 15	“	Fulghum Manufacturing Co.	Maple flooring & tables	idle	......
246	“ 16	“	A. W. Wait Manufacturing Co.	Interior finish	run.	full
247	“ 16	“	William Beitner	Lumber and chair stock	“	“
248	“ 16	“	Traverse City Iron Works	Machinery	“	“
249	“ 16	“	Hannah, Lay & Co.	Flour and feed	“	“
250	“ 16	“	Star Steam Laundry	Laundry work	“	“

District No. 5. *T. A. Ely, Deputy Inspector.*

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly enclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection?	No. given factory for 1896.
60	*	50	50	----	$1,500	----	----	------	10	60	----	----	yes	yes	no	‡	yes	yes	yes	yes	----	----	201
60	--	20	----	----	------	----	----	------	----	----	----	----	---	---	----	----	----	----	----	----	----	----	202
60	--	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	203
60	60	85	85	----	2,500	----	----	------	10	60	----	----	yes	yes	no	‡	yes	ye	yes	yes	----	----	204
60	60	4	4	----	125	----	----	------	10	60	----	----	"	"	"	‡	"	"	"	"	----	----	205
60	60	15	6	4	------	----	----	------	10	60	----	----	"	"	"	‡	"	"	"	"	yes	----	206
60	60	40	40	----	1,400	----	----	------	10	60	----	----	"	"	"	‡	"	"	"	"	----	----	207
60	--	10	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	208
60	--	20	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	209
60	60	25	25	----	800	----	----	------	10	60	----	----	yes	yes	no	‡	yes	yes	yes	yes	----	----	210
60	--	30	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	211
60	60	75	75	----	3,000	----	----	------	10	60	----	----	yes	yes	no	‡	yes	yes	yes	yes	----	----	212
60	60	65	65	----	2,800	----	----	------	10	60	----	----	"	"	"	‡	"	"	"	"	----	----	213
†	†	12	12	----	650	----	----	------	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	214
60	60	12	2	10	250	----	----	------	10	60	----	----	----	"	"	‡	"	"	"	"	yes	----	215
60	60	6	1	5	125	----	----	------	10	60	----	---	----	"	"	‡	"	"	"	"	"	----	216
60	60	18	17	1	700	----	----	------	10	60	----	----	yes	"	"	‡	"	"	"	"	"	----	217
60	60	8	5	----	250	----	----	------	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	218
60	60	20	14	----	300	----	----	------	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	219
60	60	8	5	----	150	----	----	------	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	220
60	60	30	12	----	450	----	----	------	10	60	----	----	yes	"	"	‡	"	"	"	"	----	----	221
60	60	35	35	----	1,000	----	----	------	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	222
66	66	580	580	----	12,000	----	16	yes	10	60	----	----	yes	"	"	‡	"	"	"	"	----	8	223
60	60	11	11	----	150	----	----	------	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	224
60	60	16	16	----	450	----	----	------	10	60	----	----	yes	"	"	‡	"	"	"	"	----	----	225
60	60	8	8	----	250	----	----	------	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	226
60	--	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	227
60	--	12	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	228
60	60	12	12	----	350	----	----	------	10	60	----	----	----	yes	no	‡	yes	yes	yes	yes	----	----	229
60	--	16	----	----	------	----	----	------	----	----	---	----	----	----	----	----	----	----	----	----	----	----	230
60	--	6	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	231
60	60	36	36	----	1,000	----	----	------	10	60	----	----	yes	yes	no	‡	yes	yes	yes	yes	----	----	232
60	--	5	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	233
60	60	7	7	----	210	----	----	------	10	60	----	----	yes	yes	no	‡	yes	yes	yes	yes	----	----	234
60	60	9	9	----	225	----	---	------	10	60	yes	yes	"	"	"	‡	"	"	"	"	----	----	235
60	60	23	23	----	550	----	----	------	10	60	----	----	"	"	"	‡	"	"	"	"	----	----	236
60	--	25	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	237
60	--	8	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	238
60	60	7	8	----	150	----	----	------	10	60	----	----	----	yes	no	‡	yes	yes	yes	yes	----	----	239
60	60	13	13	----	350	----	----	------	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	240
60	--	30	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	241
60	--	15	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	242
60	60	325	200	100	6,000	----	20	yes	10	60	yes	----	yes	yes	no	‡	yes	yes	yes	yes	yes	----	243
60	60	275	125	----	5,000	----	33	"	10	60	"	yes	"	"	"	‡	"	"	"	"	----	----	244
60	--	35	----	----	------	----	----	------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	245
60	60	15	5	----	200	----	----	------	10	60	----	----	yes	yes	no	‡	yes	yes	yes	yes	----	----	246
60	60	100	45	----	1,500	----	----	------	10	60	----	----	"	"	"	‡	"	"	"	"	----	----	247
60	60	25	10	----	450	----	----	------	10	60	----	----	----	"	"	‡	"	"	"	"	----	----	248
60	60	18	18	----	550	----	----	------	10	60	yes	----	yes	"	"	‡	"	"	"	"	----	----	249
60	60	12	1	4	130	----	----	------	10	60	----	----	----	"	"	‡	"	"	"	"	yes	----	250

* 66 hours-running overtime.
† 144 hours-running day and night.

‡ None required.

Inspection book No. 6. **TABLE No. 5.—Continued.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
251	Sept.	17	Traverse City	Caldwell & Louden	Wagons and sleighs	run.	full
252	"	17	"	Trav. City Elec. Light & Water Co.	Electric light	"	"
253	"	17	"	Traverse City Lumber Co.	Lumber	idle	......
254	"	17	"	Smith Bros.	Dressed lumber	"	......
255	"	17	"	The J. E. Greilick Co.	Building material	run.	full
256	"	18	"	The J. E. Greilick Co.	Lumber	idle	......
257	"	18	"	V. & A. Petertyl	Wagons and buggies	run.	full
258	"	18	"	William Jackson	Machinery	"	"
259	"	18	"	John Foot & Son	Harness leather	"	"
260	"	18	"	Acme Potato Planter Co.	Potato planters	idle	......
261	"	18	"	N. B. Keeney & Son	Sorted seeds	"	......
262	"	18	"	Alfred Jahraus	Cigars	run.	full
263	"	18	"	Grand Traverse Herald	Printed matter	"	"
264	"	19	"	Traverse Bay Eagle	" "	"	"
265	"	19	"	Traverse City Transcript	" "	"	"
266	"	21	Elk Rapids	Elk Rapids Iron Co.	Lumber	"	"
267	"	21	"	Elk Rapids Iron Co.	Pig iron	"	"
268	"	21	"	Elk Rapids Iron Co.	Chemicals	"	"
269	"	22	Bellaire	Bechtold & Richardi	Wooden trays and bowls	"	"
270	"	22	"	Henry Richardi	Woodenware	idle	......
271	"	23	"	Wm. Davenport	Shingles	"	......
272	"	23	"	Tindale & Jackson	Cooperage stock	run.	full
273	"	23	Central Lake	Cameron Lumber Co.	Lumber	idle	......
274	"	23	"	Cameron Lumber Co.	Dressed lumber	run.	full
275	"	23	Ellsworth	Ellsworth Lumber Co.	Lumber	idle	......
276	"	23	East Jordan	East Jordan Lumber Co.	"	run.	full
277	"	23	"	South Arm Lumber Co.	"	idle	......
278	"	24	Mancelona	Mancelona Hoop Co.	Veneer stock	"	......
279	"	24	"	Mancelona Manufacturing Co.	Building material	"	......
280	"	24	"	Mancelona Handle Co.	Broom handles	run.	full
281	"	24	"	Antrim Iron Co.	Pig iron	"	"
282	"	24	"	Antrim Chemical Co.	Chemicals	"	"
283	"	25	Alba	Gould & Alling	Staves	idle	......
284	"	25	Elmira	V. L. Parsons & Co.	" and heading	run.	full
285	"	25	Kalkaska	Smith Lumber Co.	Lumber	idle	......
286	"	25	"	Freeman Manufacturing Co.	Woodenware	run.	full
287	"	26	S. Boardman	Michigan Handle Works	"	"	"
288	"	26	"	Utter & Clover	Lumber	idle	......
289	"	26	"	George I. Quimby	"	"	......
290	"	26	Fife Lake	C. T. Fox	Staves	"	......
291	"	26	"	W. L. Talbert	Broom handles	"	......
292	"	26	"	Todd & Green	Wooden bowls	"	......
293	Oct.	5	Clarence	Clarence Lumber Co.	Lumber	"	......
294	"	5	Marion	Marion Manufacturing Co.	" and hoops	"	......
295	"	5	"	Dunham Bros.	Shingles	run.	full
296	"	5	"	A. M. Porter	"	"	"
297	"	6	McBain	Symes Bros.	Lumber	"	"
298	"	6	"	Dewey Stave Co.	Staves	idle	......
299	"	6	"	J. W. Cromwell	Lumber & dim'n. stock	"	......
300	"	7	Farwell	A. J. Gardner & Co.	Shingles	"	......

District No. 5. ***T. A. Ely, Deputy Inspector.***

Hours per week, running full time?	Hours per week at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection.	Average pay roll per month.	No. of children under 14 years of age employed.	No. of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	60	14	10		$450				10	60				yes	no	†	yes	yes	yes	yes			251
60	60	12	12		550				10	60				"	"	†	"	"	"	"			252
60		50																					253
60		7																					254
60	60	60	20		700				10	60	yes	yes	yes	yes	no	†	yes	yes	yes	yes			255
60		35																					256
60	60	15	10		400				10	60			yes	yes	no	†	yes	yes	yes	yes			257
60	60	4	2		100				10	60				"	"	†	"	"	"	"			258
60	60	4	3		125				10	60				"	"	†	"	"	"	"			259
60		15																					260
60		40																					261
48	48	7	6		300				8	60				yes	no	†	yes	yes	yes	yes			262
60	60	15	7	6	500				10	60		yes	yes	"	"	†	"	"	"	"	yes		263
60	60	11	5	6	400				10	60				"	"	†	"	"	"	"	"		264
60	60	3	1	2	70				10	60			yes	"	"	†	"	"	"	"	"		265
60	60	40	40		1,300				10	60			"	"	"	†	"	"	"	"			266
*	*	125	125						10	60	yes	yes	"	"	"	†	"	"	"	"			267
*	*	25	25		1,000				10	60	"	"	"	"	"	†	"	"	"	"			268
60	60	20	15		400				10	60			"	"	"	†	"	"	no	"			269
60		14																					270
60		20																					271
60	60	60	40		1,300				10	60				yes	no	†	yes	yes	yes	yes			272
60		50																					273
60	60	8	8		225				10	60				yes	no	†	yes	yes	yes	yes			274
60		35																					275
60	60	80	60		2,200				10	60			yes	yes	no	†	yes	yes	yes	yes			276
60		50																					277
60		18																					278
60		25																					279
60	60	45	45		2,500				10	60				yes	no	†	yes	yes	yes	yes			280
*	*	70	70		4,000					60	yes	yes	yes	"	"	†	"	"	"	"			281
*	*	10	10		400					60			"	"	"	†	"	"	"	"			282
60		40																					283
60	60	50	24		1,000				10	60			yes	yes	no	†	yes	yes	yes	yes			284
60		35																					285
60	60	85	65	10	2,500				10	60	yes	yes	yes	yes	no	†	yes	yes	yes	yes	yes		286
60	60	40	12	8	600				10	60				"	"	†	"	"	"	"	"		287
60		20																					288
60		22																					289
60		30																					290
60		20																					291
60		7																					292
60		30																					293
60		25																					294
60	60	11	6		200				10	60				yes	no	†	yes	yes	yes	yes			295
60	60	11	11		300				10	60				"	"	†	"	"	"	"			296
60	60	22	22		600				10	60				"	"	†	"	"	"	"			297
60		24																					298
60		23																					299
60		10																					300

*144 hours–running day and night.

† None required.

Inspection book No. 7. **TABLE No. 5.—Concluded.—**

No. given factory for 1896.	Date of inspection.		Location.	Name of establishment.	What goods manufactured, handled or sold.	Running or idle?	If running, is it full or part time?
801	Oct.	7	Farwell......	M. F. Robinson......................	Shingles................	idle	......
802	"	7	"	John Littlefield.....................	Lumber..................	run.	full
803	"	7	"	Williams Stave & Heading Co...	Staves and heading.....	"	"
804	"	8	Evart	Champion Tool & Handle Works	Logging tools............	"	"
805	"	8	"	Evart Cedar Co.....................	Shingles..................	idle	......
806	"	8	"	C. D. Angivine	"	run.	full
807	"	8	"	C. A. Waffle..........................	Dressed lumber.........	"	"
808	"	8	"	C. E. Fenton........................	Staves and heading......	"	"
809	"	9	Reed City....	Reed City Woolen Mills..........	Woolen cloth and yarn..	"	"
810	"	9	"	Welsh Mfg. Co......................	Dressed lumber..........	"	"
811	"	9	"	Wm. Horner..........................	Maple flooring............	"	"
812	"	10	"	Benjamin Machinery Co..........	Machinery	idle	......
813	"	10	"	A. Rosenberg & Son...............	Lumber..................	"	......
814	"	10	"	Lowell Mfg. Co......................	Heading	"	......
815	"	10	"	Wenzel Bros.........................	Shingles	"	......
816	"	19	Alma	Alma Roller Mills..................	Flour and feed	run.	full
817	"	19	"	Alma Woolen Mills................	Cloth and yarn...........	"	"
818	"	19	"	J. M. Montigel & Co...............	Machinery............. ...	"	"
819	"	20	"	Tinker & Hannah..................	Sash, doors and blinds..	"	part
820	"	20	"	Alma Excelsior Works............	Excelsior	idle	......
821	"	20	"	Alma Table Co......................	Tables....................	"	... ..
822	"	21	Mt. Pleasant	Graham Bros.........................	Baskets	"	......
823	"	21	"	Horning & Son......................	Heading	"	......
824	"	21	"	Chippewa Stave Co....	Staves....................	"	......
825	"	22	Clare..........	A. S. Rhodes.........................	Heading..................	run.	full
826	"	22	"	Clare Woodenware Co............	Pails and tubs............	"	"
827	Nov.	9	Big Rapids..	Crescent Furniture Mfg. Co.. ...	Sideboards & bookcases	"	"
828	"	9	" ..	Big Rapids Door & Blind Mfg.Co.	Sash, doors and blinds..	"	"
829	"	10	" ..	Lumsden & Ward..................	Dimension stock..........	idle	......
830	"	10	" ..	D. C. Crawford......................	Lumber....................	"	......
831	"	10	" ..	Trowbridge Bros....................	Hoops.....................	"	......
832	"	10	" ..	Jones & Green......................	Dressed lumber...........	"	......
833	"	10	" .	C. D. Minning	Lumber....................	"	......
834	"	11	" ..	Hood & Wright......................	Veneer lumber............	run.	full
835	"	11	" ..	Falcon Mfg. Co......................	Furniture..................	"	"
836	"	11	" ..	Big Rapids Furniture Co.........	"	"	"
837	"	11	" ..	J. Hanchett & Bros................	Saw swages and repairs	"	"
838	"	11	" ..	Darragh Bros. & Co................	Flour and feed...........	"	"
839	"	12	" ..	Wm. E. Donley......................	Electric light.............	"	"
840	"	12	" .	Michigan Cigar Co.................	Cigars	"	"
841	"	12	" ..	Big Rapids Pioneer................	Printed matter...........	"	"
842	"	12	" ..	Herald and Bulletin...............	" "	"	"

District No. 5. *T. A. Ely, Deputy Inspector.*

Hours per week, running full time?	Hours per week, at date of inspection?	No. of persons employed when running full capacity?	No. of males employed at date of inspection.	No. of females employed at date of inspection	Average pay roll per month.	No. of children under 14 years of age employed.	No of children between the age of 14 and 16 employed.	Are registers kept and statements filed of children employed under 16 years of age?	No. hr's males under 18 and females under 21 years of age work per day?	How many minutes are allowed for dinner?	Are hoisting shafts and well holes properly inclosed and secured?	Are all elevator openings properly guarded?	Are all stairs properly protected?	Where practicable, do doors swing outward or slide?	Are doors locked or bolted during working hours?	Are fire escapes provided where necessary and with suitable openings?	Are shifters used in throwing belts, and loose pulleys where possible?	Is all machinery, vats, pans, etc., properly guarded?	Are exhaust fans provided for carrying off dust where necessary?	Are suitable wash rooms and water closets provided?	Are water closets for females separate and properly screened?	No. of accidents since last inspection.	No. given factory for 1896.
60	..	10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	301
60	60	27	8	----	$600	----	----	----	10	60	----	----	----	yes	no	†	yes	yes	yes	yes	----	----	302
60	60	15	8	----	275	----	----	----	10	60	----	----	----	“	“	†	“	“	“	“	----	----	303
60	60	30	8	----	250	----	----	----	10	60	----	----	----	“	“	†	“	“	“	“	----	----	304
60	..	13	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	305
60	60	11	9	----	300	----	----	----	10	60	----	----	----	yes	no	†	yes	yes	yes	yes	----	----	306
60	60	6	4	----	150	----	----	----	10	60	----	----	----	“	“	†	“	“	“	“	----	----	307
60	60	50	48	----	1,150	----	----	----	10	60	----	----	----	“	“	†	“	“	“	“	----	----	308
60	*	10	7	3	300	----	----	----	10	60	----	----	yes	“	“	†	“	“	“	“	yes	----	309
60	60	40	40	----	1,500	----	----	----	10	60	----	----	“	“	“	†	“	“	“	“	----	----	310
60	60	15	15	----	500	----	1	no	10	60	----	----	----	“	“	†	“	“	“	“	----	----	311
60	..	17	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	312
60	..	25	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	313
60	..	23	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	314
60	..	33	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	315
60	60	24	15	----	300	----	----	----	10	60	----	----	yes	yes	no	†	yes	yes	yes	yes	----	----	316
60	60	7	3	----	200	----	----	----	10	60	----	----	“	“	“	†	“	“	“	“	----	----	317
60	60	12	4	----	250	----	----	----	10	60	----	----	“	“	“	†	“	“	“	“	----	----	318
60	54	20	10	----	300	----	----	----	10	60	----	----	“	“	“	†	“	“	“	“	----	----	319
60	..	10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	320
60	..	20	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	321
60	..	100	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	322
60	..	25	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	323
60	..	33	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	324
60	60	15	15	----	350	----	----	----	10	60	----	----	----	yes	no	†	yes	yes	yes	yes	----	----	325
60	60	50	48	2	1,500	----	----	----	10	60	----	----	yes	“	“	†	“	“	“	“	yes	----	326
60	60	65	40	----	1,800	----	----	----	10	60	yes	yes	“	“	“	†	“	“	“	“	----	----	327
60	60	70	70	----	2,000	----	----	----	10	60	----	----	“	“	“	†	“	“	“	“	----	----	328
60	..	25	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	329
60	..	10	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	330
60	..	30	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	331
60	..	15	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	332
60	..	20	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	333
60	60	46	25	----	1,300	----	----	----	10	60	----	----	yes	yes	no	†	yes	yes	yes	yes	----	----	334
60	60	115	25	----	2,000	----	----	----	10	60	yes	yes	“	“	“	†	“	“	“	“	----	----	335
60	60	35	20	----	1,200	----	----	----	10	60	----	“	“	“	“	†	“	“	“	“	----	----	336
60	60	6	5	----	250	----	----	----	10	60	----	“	----	“	“	†	“	“	“	“	----	----	337
60	60	8	8	----	400	----	----	----	10	60	yes	“	yes	“	“	†	“	“	“	“	----	----	338
60	60	4	4	----	175	----	----	----	10	60	----	----	----	“	“	†	“	“	“	“	----	----	339
48	48	7	5	----	200	----	----	----	8	60	----	----	----	“	“	†	“	“	“	“	----	----	340
60	60	8	5	3	235	----	----	----	10	60	----	----	----	“	“	†	“	“	“	“	yes	----	341
60	60	6	4	2	200	----	----	----	10	60	----	----	----	“	“	†	“	“	“	“	----	----	342

* 73 hours-running overtime.

† None required.

DEDUCTIONS FROM THE WORK IN DISTRICT NO. 5.

Organization of District.

This district is a very large one, being composed of 13 counties in the lower peninsula and the entire 16 counties of the upper peninsula. Its largest manufacturing industry is in lumber and its products. The inspector has long distances to travel, but his work is no less important than in the more thickly settled districts. The following counties compose the district:

Alger,
Antrim,
Baraga,
Charlevoix,
Chippewa,
Clare,
Delta,
Dickinson,
Emmet,
Gogebic,
Grand Traverse,
Gratiot,
Houghton,
Iron,
Isle Royal,
Isabella,
Kalkaska,
Keweenaw,
Leelanau,
Luce,
Mackinac,
Marquette,
Mecosta,
Menominee,
Missaukee,
Montcalm,
Ontonagon,
Osceola,
Schoolcraft.

Factories Inspected.

During the year the inspector inspected 342 factories, a gain of 14 over 1895. Of the factories inspected, 258 were running as against 263 running in 1895, showing about five per cent more idle establishments at date of inspection than one year before.

Hours of Labor Per Week.

Hours of labor when running full time	21,661
Hours of labor at date of inspection	16,874
Hours lost per week	4,787

Here is a loss of over 478 days of 10 hours each week by reason of running short time, making a daily loss of over 79 days. Computed at $1.34, the average daily wages paid in these factories, the daily loss is seen to be $105.86, or an annual loss of $33,134.18.

Employés and Pay.

Number of persons employed when running full capacity	17,136
Number of persons employed at date of inspection	12,831
Number less full capacity	4,305

Here is another loss to labor of 4,305 persons for each and every day. Computed at the same wages paid all employés during the year, and the daily money loss is found to be $5,768.70, or an annual loss of $1,805,603.10 which, added to the $33,134.18 by reason of running short time, shows an annual loss to labor in this district of $1,838,737.28.

Number of males employed		12,530
Number of females employed		301
Whole number employed		12,831
Number of factories employing females	34	
Total monthly pay roll of factories running		$446,590.00
Average monthly pay roll of factories running		1,730.96
Average monthly pay per employé	$34.08	
Average daily pay per employé	1.34	

Child Labor and Minors.

There were no children under fourteen years of age found employed.

Number factories employing children between 14 and 16	15
Number of such children found employed	112
Number factories where proper statements were filed	12
Number factories where statements were ordered filed	3
Whole number of factories employing children between 14 and 16	15

The employment of children of any age is less marked in this district than in any other in the State. Out of a total of 12,531 employés, only 112 were found under the age of 16.

The law was found to be enforced in regard to minors being allowed to clean machinery while in motion.

Regarding hours per day for females under 21 and males under 18:

Number factories running 10 hours per day	244
Number factories running 8 hours per day	3
Number factories not employing such males and females	11
Whole number factories running	258

It will be seen that no employés were required to work over 10 hours per day, or 60 hours per week.

Dinner Hour.

A full hour of 60 minutes was allowed for dinner in every factory inspected. The inspector found no inclination to disregard the law in this respect.

Hoisting Shafting, Well Holes and Elevator Protection.

Number factories where hoisting shafts and well holes were properly protected	51
Number factories where hoisting shafts and well holes were not used	207
Whole number factories running	258

Number factories where elevators were properly protected	20
Number factories not having elevators	238
Whole number factories running	258

Many factories in this district are saw mills and places of a kindred nature where no hoisting shafts or elevators are used. No places were found where all openings to elevators and hoisting shafts were not properly protected.

Stair Protection.

Number factories where stairs are properly protected	137
Number factories where no stairs were used	118
Number factories where orders were made for protection	3
Whole number factories running	258

The proportion of factories not using stairs in this district is very large as compared with other districts. A large per cent of the factories are mills, only one story in height. It will be seen that but three places were found where the stairs were not properly protected.

Doors and Fire Escapes.

Number factories where doors swing outward or slide	258
Number factories where doors are not locked or bolted during working hours	258
Number factories not needing fire escapes	258

It will be seen that in the matter of fire protection in the factories inspected in this district, where practicable all doors swing outward or slide. No doors are locked or bolted during working hours, and no fire escapes are needed.

Machinery.

Number factories using automatic shifters and loose pulleys	251
Number factories where such shifters and loose pulleys are not necessary	7
Whole number factories running	258

Number factories where vats, pans, saws, and all machinery are properly protected	254
Number factories not having vats, pans, etc.	3
Number factories where protection was ordered	1
Whole number factories running	258

This indicates that the factories visited by the inspector in this district were generally complying with the law regarding the protection of machinery. The inspector was watchful and vigilant. He found many places which were running at the time of his visit, but would soon close down for want of business, and where the machinery would probably never be started again, but at the same time he found a marked improvement in the protection of machinery over 1895.

Sanitary.

The inspector found but two places where it was necessary to order exhaust fans or blowers for carrying off dust. In all other places where such appliances were found necessary they were supplied. Probably in 90 per cent of the factories in this district such appliances are not necessary.

Number factories having suitable wash rooms and water closets	257
Number factories not having suitable wash rooms and water closets	1
Whole number factories running	258

Number factories having separate closets for females	33
Number orders made for separate closets for females	1
Number factories not requiring such separate closets	224
Whole number factories running	258

Sanitary regulations were generally observed in these factories, the inspector finding very little objection to a strict compliance with the requirements of the law.

Accidents.

Only seven accidents were reported in this district in 1896, against 20 reported in 1895. Of the ones reported in 1896, only one was fatal, as compared with three fatal ones in 1895, showing a gratifying improvement in this direction in the past year.

Remarks.

Those interested in these statistics will find much information in table No. 5, not entering into the deductions. A careful study will be found interesting. The few changes ordered and a review of the accidents follow, the number by which they are designated being the number of the factory as noted in the table.

CHANGES ORDERED DURING YEAR.

DISTRICT NO. 5.

[The number refers to the inspection number in table.]

No. 20.—Ordered gates for elevator repaired.

No. 50.—Ordered separate closets for females.

No. 89.—Ordered registers kept of all children employed under the age of 16 years.

No. 90.—Ordered statements placed on file with name and age of all children employed under 16 years.

No. 102.—Ordered blowers repaired.

ACCIDENTS REPORTED DURING YEAR.

DISTRICT NO. 5.

[The number refers to the inspection number in table.]

No. 20.—September 5, 1895. T. J. Rosman, age 35, married, employed at small saw by Stebbins Mfg. Co., Lakeview, lost one finger. Was disabled two months. Doctor's bill paid by firm. The accident could not have been guarded against.

No. 117.—June 13, 1896. Andrew Torst, age 27, single, employed running wheelbarrow for Portage Entry Quarry Co., Marquette, was badly cut on head by guy rope breaking and letting truck fall. Was disabled two weeks and did not receive wages during time disabled.

No. 153.—June 4, 1896. G. H. Wilson, age 45, married, engineer, in the employ of Corbin & Mead, Sidnaw, killed while putting on belt when the machine was in motion. He was on a platform and foot slipped and he fell, striking on head and broke his neck.

No. 184.—Sept. 7, 1895. F. T. Ely, age 35, married, employed as sawyer for W. L. McManus, Petoskey, had left eye put out by board thrown from saw. Was disabled four weeks and received no wages while disabled. The accident could not have been guarded against.

No. 223.—July 10, 1896. Donald Keith, age 20, single, polisher, employed by the Hall & Munson Co., Bay Mills, caught his hand in machine and badly crushed it. Was disabled four weeks, and received wages in full. Doctor's bill and board paid by company.

No. 223.—July 11, 1896. Elliot Scott, age 23, single, employed as sawyer by the Hall & Munson Co., Bay Mills, had fingers cut by hitting his right hand against saw. Was disabled ten days, and received no wages during time disabled

No. 223.—July 31, 1896. Charles Carrigan, age 25, single, machine hand in the employ of the Hall & Munson Co., Bay Mills, ran his hand against the saw and had three fingers on right hand cut off. Was disabled two months and received wages in full during time disabled. Doctor's bill and board paid by company.

SUMMARY.

GENERAL SUMMARY OF THE WORK FOR 1896.

The work of inspection for 1896 has been thorough, energetic and minute. The several deputy inspectors have each been careful and painstaking. Their experience of the past four years has been of great benefit, not only to the State, but in assisting the inspectors in their work. There were 2,991 factories inspected during the year, the work being summarized as follows:

Number factories inspected in district No. 1	900
Number factories inspected in district No. 2	628
Number factories inspected in district No. 3	725
Number factories inspected in district No. 4	396
Number factories inspected in district No. 5	342
Whole number factories inspected	2,991

Number factories running in district No. 1	862
Number factories running in district No. 2	509
Number factories running in district No. 3	635
Number factories running in district No. 4	308
Number factories running in district No. 5	258
Whole number factories running	2,572

Number factories idle in district No. 1	38
Number factories idle in district No. 2	119
Number factories idle in district No. 3	90
Number factories idle in district No. 4	88
Number factories idle in district No. 5	84
Whole number factories idle	419

Number factories running full time in district No. 1	658
Number factories running full time in district No. 2	432
Number factories running full time in district No. 3	564
Number factories running full time in district No. 4	278
Number factories running full time in district No. 5	255
Whole number factories running full time	2,187

Number factories running part time in district No. 1	204
Number factories running part time in district No. 2	77
Number factories running part time in district No. 3	71
Number factories running part time in district No. 4	30
Number factories running part time in district No. 5	3
Whole number factories running part time	385

Hours of Labor.

Hours weekly, if running full time		183,111
Hours weekly as running at date of inspection		152,743
Loss in hours each week		30,368
Loss of time daily, by reason of running short hours,	506	days.
Loss of time annually by reason of running short hours	158,378	days.
Daily financial loss, computed at $1.23* per day		$622 38
Annual financial loss, computed at $1.23 per day		194,804 94

Employes.

Number employés when running full capacity		149,743
Number employés at date of inspection		101,053
Loss, as compared with when running full capacity		48,690
Loss of time daily by reason of running less capacity	48,690	days.
Loss of time annually by reason of running less capacity	15,239,970	days.
Daily financial loss, computed at $1.23* per day		$59,888 70
Annual financial loss, computed at $1.23 per day		18,745,163 10

Add to this last number $194,804.94, the annual loss by reason of running short hours, and it will be found the annual loss to labor in the factories inspected in the past year amounts to $18,939,968.04.

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* Average wages paid all factory employés in the State in 1896.

Number males employed at date of inspection		87,027
Number females employed at date of inspection		14,026
Whole number employés at date of inspection		101,053
Number factories that employed females	884	

Child Labor.

Number factories where children over 14 and under 16 were employed	315
Number of children over 14 and under 16 employed	1,444
Number factories where children under 14 were found employed	37
Number children under 14 found employed	66

About 12 per cent of the factories running employed children between the ages of 14 and 16 years. These constituted less than 1½ per cent of the entire number employed. The number of children under 14 years of age found employed is reduced from 140 of last year, to 66 this year, while the number of factories employing them is reduced from 64 to 37. In all cases children under 14 years of age were ordered discharged immediately.

Monthly Pay Roll.

Aggregate monthly pay rolls	$3,237,682 00
Average monthly pay roll	1,258 82
Average per capita, per year for employés	384 48
Average per capita, per month for employés	32 04
Average per capita, per day for employés	1 23

Dinner Hour.

Number that allow 60 minutes for dinner		2,008
Number that allow less than 60 minutes for dinner		564
Whole number of factories running		2,572
Number that allow less than 45 minutes for dinner	340	

In all cases where less than 45 minutes were allowed for dinner, permission was given by inspectors for a shorter period, for various reasons.

Minors.

Number factories requiring 12 hours a day of males under 18 and females under 21	5
Number factories requiring 11 hours a day of such employés	1
Number factories requiring 10 hours a day of such employés	2,193
Number factories requiring 9½ hours a day of such employés	9
Number factories requiring 9 hours a day of such employés	211
Number factories requiring 8 hours a day of such employés	133
Number not employing such labor	20
Whole number factories running	2,572

Average hours per day required of males under 18 and females under 21 .... 9 4-5

Hoisting Shafts and Well Holes.

Number factories where hoisting shafts and well holes are properly guarded and secured	856
Number factories where they are not properly guarded and secured	10
Number factories not having hoisting shafts and well holes	1,706
Whole number factories running	2,572

Automatic Trap Doors or Gates.

Number factories where automatic trap doors or gates are provided on all floors where elevators are used	430
Number factories where automatic trap doors or gates are not provided	266
Number factories not having elevators	1,876
Whole number factories running	2,572

Stairs.

Number factories where stairs are properly guarded and screened	1,874
Number factories where stairs are not properly guarded and screened	105
Number factories not having stairs	593
Whole number factories running	2,572

Doors.

Number factories where doors swing outward, or slide where practicable	2,562
Number factories where doors do not swing outward or slide where practicable	10
Whole number factories running	2,572

There were but five factories where the doors were locked or bolted during working hours. These were in the 2d and 3d districts.

Fire Escapes.

Number factories where fire escapes were provided	462
Number factories where fire escapes were not provided	32
Number factories where fire escapes were not necessary	2,078
Whole number factories running	2,572

Shifters and Loose Pulleys.

Number factories where shifters were used for throwing belts and where loose pulleys were provided	2,108
Number factories where such shifters and loose pulleys were not necessary	444
Number factories where such shifters and pulleys were ordered	20
Whole number factories running	2,572

Vats, Pans, Machinery, Etc.

Number factories where vats, pans and machinery were properly guarded	1,894
Number factories where vats, pans, and machinery were not properly guarded	194
Number factories not having vats, pans and machinery	484
Whole number factories running	2,572

Sanitary.

Dust arresters or exhaust fans were provided where necessary in nearly all of the factories. Only 35 factories out of the total of 2,572 that were running were without them where they were necessary, eight of these being in the first district, six in the second, 16 in the third, three in the fourth and two in the fifth.

Number of factories provided with suitable washrooms and water closets	2,543
Number of factories not provided with suitable washrooms and water closets	29
Whole number of factories running	2,572

Number of factories having separate water closets for females	817
Number of factories not having separate water closets for females	52
Number of factories where separate water closets for females are not necessary	1,703
Whole number factories running	2,572

Changes Ordered.

Number factories where changes were ordered in district No. 1	211
Number factories where changes were ordered in district No. 2	158
Number factories where changes were ordered in district No. 3	182
Number factories where changes were ordered in district No. 4	53
Number factories where changes were ordered in district No. 5	5
Whole number factories where changes were ordered	609

Accidents.

Number accidents reported in district No. 1	50
Number accidents reported in district No. 2	17
Number accidents reported in district No. 3	53
Number accidents reported in district No. 4	37
Number accidents reported in district No. 5	7
Whole number accidents reported	164

Number fatal accidents in district No. 1	4
Number fatal accidents in district No. 2	2
Number fatal accidents in district No. 3	2
Number fatal accidents in district No. 4 *	5
Number fatal accidents in district No. 5	1
Whole number fatal accidents	14

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* Two of these were from boiler explosion in Michigan Salt Co., Marine City.

Comparison with Accidents of 1895.

Number accidents reported in district No. 1, 1895	85
Number accidents reported in district No. 2, 1895	23
Number accidents reported in district No. 3, 1895	88
Number accidents reported in district No. 4, 1895	37
Number accidents reported in district No. 5, 1895	20
Whole number accidents reported in 1895	253
Whole number accidents reported in 1896	164
Decrease in number of accidents in 1896	89

Number fatal accidents in district No. 1, 1895	26
Number fatal accidents in district No. 2, 1895	3
Number fatal accidents in district No. 3, 1895	7
Number fatal accidents in district No. 4, 1895	4
Number fatal accidents in district No. 5, 1895	3
Whole number fatal accidents in 1895	43
Whole number fatal accidents in 1896	14
Decrease in number of fatal accidents in 1896	29

Remarks.

This brief summary will indicate at a glance the work done by the factory inspectors during the past year, but a study of the several tables containing their work will be found of much interest in making comparisons.

In 1895 over 90 per cent of the factories inspected were running, and about 82 per cent of them were running full time. In 1896 only a little over 86 per cent of the factories inspected were running, and only a little over 73 per cent of them were running full time. In 1895 the average wages per capita paid all employés in the factories inspected was $1.32 per day. In 1896 the average wages per capita paid all employés was $1.23 per day, showing that the wages paid in 1896 were about 7 per cent less than in 1895.

Viewed in any light, there can be but one conclusion. The manufacturing institutions and their employés in Michigan have passed a year of great depression. The loss to labor by reason of factories running on short time and less their full capacity of employés, even at the low wages paid is nearly $19,000,000, added to this, the ones who have found employment suffer a reduction in wages during the year of nearly 7 per cent. Great as has been the depression in the last few years, the past year has been the most serious of all. It is to be hoped the year just opening will close with brighter auspices to the operators and employés of Michigan factories.

TWELFTH BIENNIAL REPORT

OF THE

STATE BOARD

OF

FISH COMMISSIONERS

FROM DEC. 1, 1894, TO DEC. 1, 1896

BY AUTHORITY

LANSING
ROBERT SMITH PRINTING CO., STATE PRINTERS AND BINDERS
1897

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Bulletin No. 6.

NOTE OF TRANSMITTAL.

To the Governor—The board herewith submits a history of its operations for the biennial period from November, 1894, to November 30, 1897. Herein will be found a statement covering in detail all the work of propagation and distribution of food and game fish, the improvements made at stations already established, and the new work carried forward during the time covered by the report, and the proposed new work.

HERSCHEL WHITAKER,
HORACE W. DAVIS,
FREEMAN B. DICKERSON,
State Board of Fish Commissioners.

"A certain man had a goose which laid him a golden egg every day. But not contented with this, which rather increased than abated his avarice, he was resolved to kill the goose and cut up her belly, that so he might come at the inexhaustible treasure which he fancied she had within her. He did so; and, to his great sorrow and disappointment, found nothing."

"They who are of such craving, impatient tempers that they cannot live contented when fortune has blessed them with a constant and continuous sufficiency, deserve to be deprived of what they have. And this has been the case of many ambitious and covetous men, who, by making an essay to grow very rich at once, have missed what they aimed at, and lost what they had before."—*Æsop's Fables.*

REPORT OF THE STATE BOARD OF FISH COMMISSIONERS FOR 1895-1896.

The board, during the period covered by this report, has been engaged in carrying forward the work heretofore established, of the artificial hatching and distribution of fish for the great lakes and inland waters of the State. The stocking of our inland streams with brook trout has been carried on to the full limit of our capacity. The results of this work, as heretofore, are full of the greatest encouragement. What has been said regarding the success of this work in former reports has been emphasized by our subsequent experience.

A better object lesson of the success of the artificial propagation and planting of brook trout is not presented anywhere in any country than in Michigan.

Douglas Houghton, the eminent scientist, and the surveyor of a great part of the wild lands of this State, said of the streams of the lower peninsula, based on personal observation and examination, that they contained no brook trout. Mr. Bela Hubbard, an associate and companion of Houghton, in his Memorials of a Half Century, makes the same statement, and they are corroborated by the early settlers, woodsmen and sportsmen.

Although the commission was organized twenty-four years ago, the first few years of its existence were given to the gaining of a knowledge of the subject of fish culture, and the marshalling of means with which to prosecute the work. Practically the work of planting our streams with brook trout did not begin until 1879. Since that time our facilities have been gradually enlarged, and the work has gone forward, steadily increasing. Now the streams of every county in the State but three, whose waters are not suited to this fish, furnish excellent trout fishing. The streams of some of our river basins, like the Pere Marquette and the Au Sable, furnish trout fishing not to be excelled in this country. In both of these streams and their tributaries may be caught brook trout, rainbow trout and grayling.

While it may be said the trout is a game fish, it must not be forgotten that they are also a source of profit to the State. Passing over the fact that the residents of the sections in which these streams are found derive from these sources fish for their own consumption, we come to the more significant value they have for the State, in bringing here the residents of other states, who leave a substantial evidence of their presence in the money paid to railroads and liverymen for transportation, and to hotels and tradesmen for board and necessaries. The money the State expends in the planting of brook trout is thus returned many times over and is a paying investment in every sense.

While this work is all necessary and falls within the province of our duty, it is of but slight significance compared with the greater work to which we have devoted our energies, the building up of our great commercial fisheries. We have now reached the point where the output from our fish hatcheries places our work of planting of commercial fish among the most effective in the country.

Our experience in artificial propagation and our knowledge of its past successes, confirm us in the opinion that this great work can be successfully carried on to a renewal of the wasted fisheries, if we can bring to our aid in this effort intelligent legislation, limiting commercial fishing operations to the capture of *mature, adult fish* only.

The object of fish culture, of fishing operations and of protective legislation, in the hands of men who consider the necessity of the preservation of the fisheries should be to follow a policy that will permit the catching and marketing of merchantable fish, and the supervision of netting, and to stop the capture of fish too young and immature to spawn and having but small market value.

To proceed on any other line than this means an ultimate destruction of our commercial fisheries, the elimination of fish as one of our common articles of food, the destruction of the fisherman's industry, from which he gains his livelihood, and makes wholly useless the efforts of the State is making to preserve the fisheries by planting. The fisherman should take counsel from his experience, and act in accordance with the conclusions that naturally follow.

The history of commercial fishing in the great lakes for the past twenty-five years *is the history of an abuse.* The people of the State are more deeply interested in the preservation of the great lake fisheries than the person who draws from them the product that gives him his daily bread. The people own the fisheries, and the public right to their maintenance is above that of the fishermen as a class. All acts exercised by the fisherman in following his business are subordinate to the public's right to have the fisheries maintained. He enjoys a *privilege* and not a *right* in netting in the public waters, and he must so conduct his operations that he will not endanger the right of the public to have the fisheries preserved for the future.

The urgent necessity for steps to prevent the further wasting away of the great lake fisheries first challenged public attention in this State about twenty-four years ago, when the inroads upon the parent stock had become manifest. At that time modern fish culture was in its infancy, but the experience of those interested in the artificial propagation of fish showed that its possibilities were great.

The State of Michigan, at this juncture, recognizing the importance of these discoveries, and the promise it gave for a renewal of her fisheries, organized a Commission of Fisheries, investing it with power and authority to artificially hatch and distribute in the public waters of the State, the choice commercial varieties of fish that had so long made these waters famous. Money was appropriated as needed and the work has been since carried on in the public interest, and not for the benefit of any class or industry.

It was believed—and there was warrant for that belief under fishing operations as then conducted—that artificial propagation alone would ultimately bring back the productiveness of the fisheries. But at that time, and for several years following, the output of the hatcheries was comparatively insignificent. Time was needed to develop the new industry and the increase of hatching operations was naturally slow.

At the outset, the task of a restoration of the fisheries after sixty years of depletion confronted the board. This had to be made good in the face of yearly increasing waste, caused by the increase in the number of fishermen's boats and nets.

Custom had sanctioned the taking and marketing of all fish the nets would take. In the east, west, and south the demand for whitefish and lake trout was increasing.

The fisherman's business became a lucrative one, large sums of money were made in a single season's operations, and the result was the natural one, the enlistment of more capital and men in the business and a large increase in the number of devices of capture.

As a result, the shoals and reefs of the entire lake system were covered with the nets of the fishermen during the spawning season, and the catch grew to be enormous. Fish became a drug on the market, and those that could not be marketed fresh were salted and sold at much lower figures than when fresh. The ease of capture and the large quantities taken made it a profitable business considering the money invested. At this time fishing was prosecuted with small sailboats and gill nets.

In 1850, or perhaps a little earlier, that most killing of all netting devices, the pound net, was first introduced into our waters. This method of fishing greatly increased the catch and still larger profits were derived from the fisheries.

About the year 1868 came the invention of the modern freezer, in which fish might be kept in a frozen condition, ready to be marketed as fresh fish during the seasons of the year when the markets were not overstocked with fish freshly caught, thus affording a new and lucrative opportunity for the investment of means in fishing.

With no limitation whatever laid on season or device for capture, fish were taken whenever and wherever they could be found. Schools of fish were pursued for miles by the gill netters; the spawning reefs were covered with nets during November and December when the fish came on to spawn, and countless numbers of milting males and females, ready to spawn, were taken heavy with ova and milt and killed before performing the act that would add to the stock with which the lakes were to be renewed.

As time went on the havoc began to manifest itself. Localities that once produced large quantities of fish began to decline in yield, and finally became unproductive. The constant pursuit of the fisheries naturally resulted in the extermination in a great measure of the large and merchantable fish. But the fishermen had invested large sums of money in the enterprise and the diminution of the catch to the point where it ceased to pay and where losses of investment threatened, led them to change their methods of capture, to still make the business profitable.

Then came the first step in the contraction of the meshes of the nets for the capture of small fish. Up to this time nets with meshes of five and six inches in extension had served all purposes, and took nothing but large fish, and this diminution of size of mesh has contributed in a large measure to the present unprofitable condition of many of our fisheries, and threatens their absolute extinction.

A single illustration of this diminution of size of mesh and its gradual progress was brought to our attention during the past summer, by one who has long been familiar with the lake fisheries, and is a fair example of the history of the gradual diminishing size of the meshes of the nets in the great lake system in the past few years.

The locality referred to is the east shore of Lake Michigan, but it can be said that what is true in this respect of this locality applies with equal force to our entire lake coast. The information here given was derived from a reliable source and can be authenticated beyond a doubt.

The meshes had been contracted considerably before the year 1870. In 1870 the size of mesh of gill nets fished on that shore was 4¼ inches, and down to the past season has been reduced in this ratio, from 4¼ to 4⅛ inches, 4, 3⅞, 3½, 3¼, 3⅛, 3, 2⅞, 2¾, 2⅝, 2½, 2⅜, and now the size of mesh is 2¼ inches.

It is not generally understood what is meant in speaking of the size of meshes of nets. The measurement of all meshes means the length of mesh when it is stretched to its utmost extension. The same mesh, when opened, as used in fishing, is very much smaller than is generally thought. The idea commonly accepted is that size as applied to a mesh means the size of the opening as fished, but this is not the fact. A three inch mesh does not mean a net that has a three inch opening.

Herewith are given a number of illustrations, showing the sizes of meshes of nets, beginning with a six inch mesh, closed, as they are usually measured, and meaning its entire length when so closed. Following this will be found the same mesh shown opened as fished, and other illustrations showing different sizes of meshes:

**A*. Six-inch pound net mesh, as measured, and the same as used in fishing.
**B*. Five-inch pound net mesh, as measured, and the same as used in fishing.
C. Four and one-quarter-inch gill net mesh, as measured, and the same as used in fishing.
D. Three and one-half-inch pound net mesh, as measured, and the same as used in fishing.
E. Two and three-quarter-inch gill net mesh, as measured, and the same as used in fishing.
F. Two and one-half-inch gill net mesh, as measured, and the same as used in fishing.
G. Two and one-quarter-inch pound net mesh, as measured, and the same as used in fishing.
H. Two-inch pound net mesh, as measured, and the same as used in fishing.

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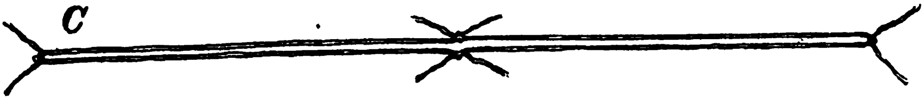
* Neither of these sizes are now much used.



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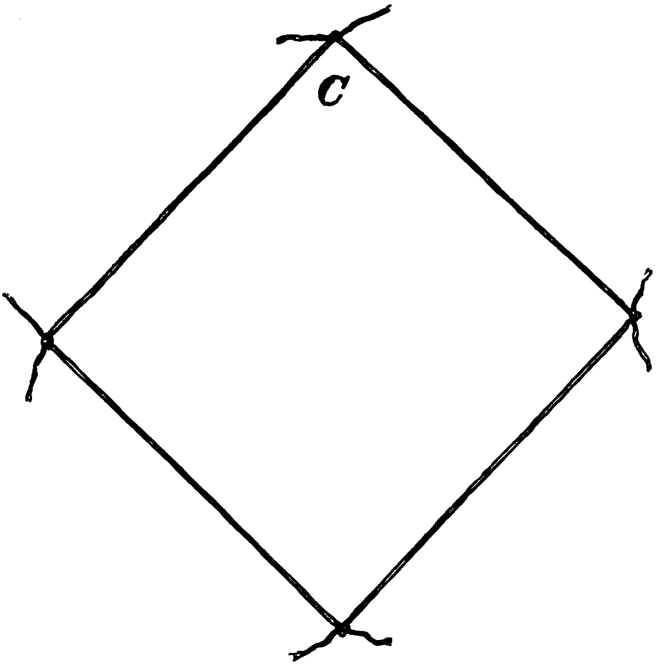

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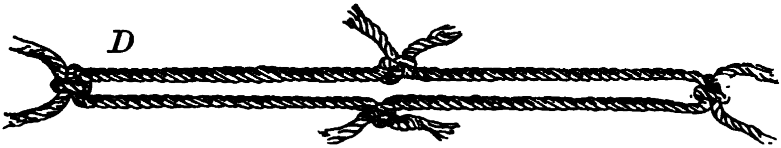

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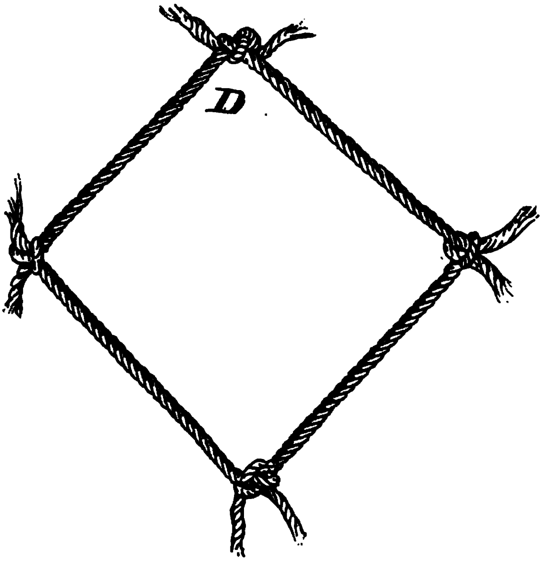

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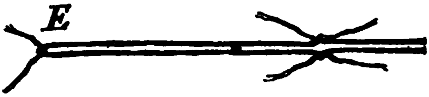

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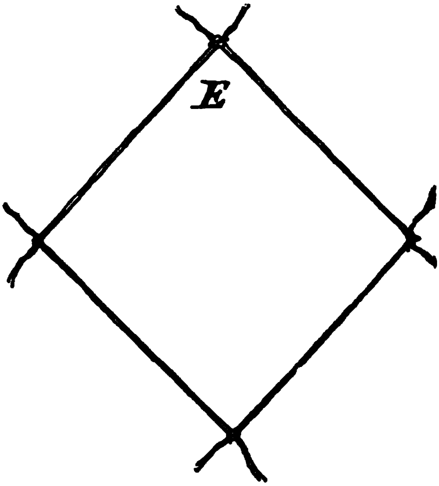

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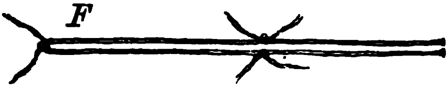

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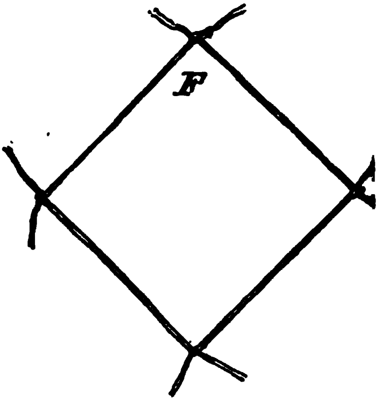


AS USED IN FISHING.

Commencing with the middle or latter part of October, the gravid females and milting males of the whitefish and salmon trout, with unerring instinct turn from the summer feeding grounds, to the shoaler water where gravelly reef or rocky bottom offer tempting places of resort for the performance of the reproductive act. To these places they swarm in large numbers and remain engaged in spawning until as late as the 10th of December, in certain localities, although the month of November covers the principal spawning period of the whitefish, and the last half of October and the month of November the spawning season of the salmon trout. These spawning reefs are known not only to the fish, *but also to the fishermen,* who there meet them with every device of capture. Comparatively few fish are able to reach the spawning beds unmolested by nets, and the most profitable season of the year is then realized by the fishermen.

When the ice and storms of winter make fishing impossible or uncertain, fishing is abandoned, and January and February and a part of March may be said to be the only season of the year when fishermen and nets are idle and the fish are not pursued and taken, although in Lake Michigan and Saginaw Bay it is pursued almost continuously.

It must be borne in mind that the destruction of the fisheries is but in small measure represented by the number of parent fish thus taken upon the spawning beds. A great menace to the fisheries is the destruction of the immense quantities of ova that are lost by killing the fish before spawning, which, if left unmolested during the month of November would contribute largely to the increase of their species.

As soon as the spring season permits, the active operations of fishing are again begun. The pound nets are set and the gill nets begin their work.

The pound net is a trap device, in which the fish are preserved alive when taken, and it therein differs from the gill net, in which the fish are usually killed.

The pound net is set approximately at right angles with the shore and consists of the "lead," which is the fishing part of the device, the "heart" and the "pocket" or "pound."

In operation this device presents the following appearance:

In principle the net operates after this manner: The fish in passing up and down the shore are suddenly confronted by the "lead" of the net, which is usually of large mesh, presenting a bar to their progress, and serving simply to turn them from their course. When thus turned, they seek the deeper water and not the shore or shallower end of the lead; thence they work along the lead until they pass into the heart, and from thence into the pocket or pound. As before stated, this net is most destructive because it takes everything.

At stated intervals the net is visited, the lines securing the corners of the front side of the pound are released from the stakes which hold them, and the front and sides are lifted and carried toward the back of the net, and as soon as the net is sufficiently raised, the fish are scooped out with a hand net into the boat and the net is re-set. The meshes of the pocket, or pound, should be made sufficiently large to allow the escape of the small fish.

Pound nets are usually set in strings, the lead of the second net beginning at the rear or back of the pound of the first, the lead of the third beginning at the back of the pocket of the second, and so on. In localities where shoals are extensive, for instance in Saginaw Bay, and on the north shore of Lake Michigan, these nets have been set in strings of as high as *twenty-five.* The average length of leads is from 75 to 80 rods. It will be seen that this net is a most formidable engine of destruction. In addition it must be understood that these nets, in practice, are set in strings as long as the fisherman chooses and finds profitable, and the strings as closely together up and down a shore as his desire may incline him.

Gill nets are largely used and in this device the fish are caught by gilling, *i. e.*, in attempting to pass through the net the gills of the fish become enmeshed in the twine and they soon die.

As the fish diminished in size by constant fishing, the meshes of the nets were ordered made smaller. Legislation should require the meshes of the nets to be enlarged, thus permitting the escape of the small and immature fish.

All fish marketed are classified by the wholesale buyers into three grades, and the grades thus established govern the grading of commercial fish on the great lakes in this State and are known as the Chicago inspection rules.

These rules were established soon after the catch of small fish began to be important in quantity, *and were made to protect the large dealer, not to protect the small fish from capture.* The presence of any considerable quantity of small fish thrown on the market, mixed with larger fish, resulted in loss to the buyer, as he was paying only for merchantable sized fish, while he was getting, in fact, a large proportion of small ones. that, under the demands of the trade, had to be culled. The undersized fish are worth but a small price compared with the larger fish. Thus, in order to *protect himself* the wholesaler established this system of inspection. *It did not, nor was it intended to, stop the taking of small fish,* but it served the commercial end, by separating the large from the small fish, which are worth but a bagatelle compared with what their value would be if left in the water for two more seasons.

It is a just criticism of such methods to say that a business that calls for any such commercial regulation has fallen into a condition where the strong arm of the law should intervene to correct an abuse that is manifest on its face, or the State must sit supinely by and see her fisheries which are a source of wealth and of cheap food to her people, absolutely wiped out.

The following are the Chicago inspection rules:

"Standard No. 1 whitefish, shall consist of sound whitefish, well cleaned, trimmed, with head off, split on the back, free from rust or ragged, weighing not less than one and one quarter pounds each, not measuring less than twelve inches, measured from extreme scale on tail to extreme scale on neck.

"Standard No. 2 whitefish, shall consist of sound whitefish, well cleaned, trimmed, with head off, split on the back, free from rust or ragged, weighing not less than *three-quarters of a pound each,* not measuring less than ten inches, measured from extreme scale on tail to extreme scale on neck.

"Standard No. 3 whitefish, shall consist of sound whitefish, well cleaned, with head off, split on the back, smooth on the face, free from rust or ragged, *weighing less than three-quarters of a pound.*

"Standard No. 1 trout, shall consist of sound fish, weighing not less than two pounds, well cleaned, trimmed, with head off, skull bone out, split on the back, free from rust or ragged.

"Standard No. 2 trout, shall consist of sound fish, weighing less than two pounds, well cleaned, trimmed, with head off, skull bone out, split on the back, free from rust or ragged."

Having spoken of the character and varieties of nets that are most largely used in the great lake fisheries, we will now proceed to a consideration of the number and the length of these devices fished in the great lakes within the jurisdiction of this State alone, as they are the only ones with which we are directly concerned.

The coast Michigan possesses bordering the lakes is very close to 2,000 miles, following the indentations of coast and bays. For a better understanding of the application of the fishing devices to the water, it may be well to state that the fish under natural conditions are not distributed equally in all parts of the lakes. Certain portions of the lakes are known to be "feeding grounds," where the fish are found at certain seasons, and they pass from these places during the month of November to other places where their spawning grounds are found.

In considering the number and extent of fishing devices it may be said that in practical fishing operations the nets are not spread over the entire waters of the lakes, but are grouped in certain localities where the fishing grounds exist. With this understanding, a better comprehension may be had of the immense destruction that can be wrought with the large number of nets now fished in our waters.

The statistics of the fisheries of this State for the year 1895, carefully taken under the direction of this board, show that there were 22,201 gill nets fished whose length was 2,380,014 fathoms, or *2,740 statute miles.*

That there were 1,588 pound nets, the length of the leads of the same being 226,772 fathoms, or *257 statute miles.*

That there were 636 seines and fyke nets, measuring in length 34,789 fathoms, or *39 statute miles.*

Making a total length of nets fished in Michigan waters alone *3,036 statute miles.*

As an object lesson in this connection that will be better understood, these nets, if set end to end, *would cover our entire lake coast one and a half times*; or, if stretched from Detroit westward, would reach to San Francisco and extend into the Pacific *five hundred miles.* It is a marvel under this condition of things that any fish escape. The foregoing facts concerning the fisheries and methods of fishing show the influences that have been at work since the discovery of the Northwest in accomplishing the great waste of the parent stock.

For the last fifteen years repeated attempts have been made by the commission to secure a regulation of the fisheries by the enactment of laws to prevent the taking of whitefish and trout during the spawning season, and to enlarge the meshes of the nets to permit the escape of small fish. All attempts to pass such legislation have thus far failed, because of the ability of the fishermen to influence the legislature against it. It is another instance of the power of vested capital in a fight against public interest when the public itself takes no personal interest in the matter. Nothing but the arousing of public spirit in the legislature, to the necessity of the preservation of the fisheries, will save them from early destruction. The fishermen are enjoying the benefits of the bounty of the State in restocking the waters, without cost to them. In other words, and in plain language, what the fishermen desire is to be the chief beneficiaries of the fisheries, and their attitude has been one of continual opposition to any attempt to prevent a waste and destruction of the fisheries. They wish to take everything that comes to their nets regardless of the people's rights to have good fishing maintained. They believe in the principle: "After me the Deluge."

There has been an entire change in the methods of the fisheries within a few years. There was a time when the fisherman, the man directly interested in the catching of fish and in the money to be made from the business, was the man most deeply interested in the pursuit. With the decay of the fisheries came changed conditions. Times began to be hard for the fisherman. He had no money to invest in new twine. Then came the man of capital who had money to loan, who was making money in the wholesale-way out of the fishing industry. This man never fished for himself. He stayed ashore. He never endured the hardships of the calling. His interest in the fisheries began and ended with the profits that might be made by buying and marketing fish. His hands were not roughened by exposure. He did not participate in the personal hazards of the calling of the fisherman. As a rule, he had no personal knowledge of the details of the handling of nets, and such information as he possessed was wholly theoretical, yet, before committees, whose business led them to investigate these abuses, his voice has ever been loudest in defense of the "perils and hardships of his calling!" although his sufferings were all vicarious.

He offered to furnish the small fisherman with nets and trust him for his pay. Like all offers of the kind, the fisherman found it easier to get into debt than to get out, and in fact they seldom are out of debt to the men who furnish them with nets and control the price of fish in the only market open to him; the steamer of the buyer that visits the fisheries on stated days and takes his fish. As the fishing industry on the lakes now stands, the substantial profit is gathered from them by the man of large means, who is often a non-resident and is thus able to retain the small fisherman in a semi-serfdom or vassalage.

The statistics of the catch of whitefish in Michigan waters in 1895 shows that there were 3,142,170 pounds of whitefish caught and marketed; 2,134,170 pounds were No. 1, and 1,008,000 pounds were No. 2 and under. Baldly stated, this means that one-quarter of the catch were fish classified as No. 2's and under, which sold for about 2c per pound. If these fish had been permitted to remain in the lakes for another year, the increase in value, weight and price considered, would have been one-third greater. But the price is of small significance when we think of the serious results that follow such senseless methods. No fish should be put upon the market except such fish as have a good merchantable value, and the young and immature fish should be excluded from the catch.

The significance of present conditions will be more apparent when it is appreciated that a whitefish does not spawn before she has attained a weight of at least two pounds, and that the taking and marketing of any female fish under that weight means that there has been eliminated from the supply not only a fish that has never contributed anything to sustain the stock, but it has resulted in placing on the market a fish of little commercial value. One year more and she would have gained largely in weight, and if permitted to pass beyond the spawning season, would have added her quota of embryos to the perpetuation of her species.

Evidence might be multiplied of the wholesale destruction of small whitefish and salmon trout in our waters. One or two incidents of recent occurrence, however, must suffice. This season, a wholesale fish dealer in Detroit received from a Grand Haven firm a barrel of small whitefish, about the size of a pork barrel. Notice was given to the commission of the arrival of the shipment, and we were invited to inspect and examine them. At a low estimate the barrel contained between twenty-five hundred and three thousand whitefish. The shipper notified the consignee that *he could supply him with a like quantity and kind every day during the season.* The offender with others was arrested and their nets found to be under the legal size of mesh, although the size prescribed was *only 2¼ inches.* Nets to the value of $25,000 were seized in this one locality, and it is a notorious fact that the fishermen all over the lakes are with few exceptions operating with like illegal nets.

The plea of these fishermen was an ignorance of the law, although their attention was called to the illegal size of the mesh when the nets were ordered, and they persisted in ordering them under the statutory size. The hollowness of this claim is apparent.

In considering the question of what is necessary to re-stock the lakes with the whitefish, let us look at the great task confronting the board. In the first place, unrestricted fishing operations, as to season or quantity or size of fish taken, have been carried on uninterruptedly for years. The parent stock and its power to sustain itself has been impaired by the killing of immature female fish that have never spawned, the adult fish have been caught in immense numbers on their spawning beds before casting their ova, and the fish artificially hatched and distributed have been caught and marketed before coming to a marketable size.

To correct this, intelligent laws should be passed and *enforced,* permitting the taking of adult fish, and leaving the smaller ones to come to maturity. Opportunity should be afforded the gravid fish to spawn unmolested. If this be done, with the large output of artificially hatched fish now being put in the lakes, we know that the waters of our State will in a few years again teem with the whitefish and salmon trout. The food of the young and of the adult fish is as plentiful now as it ever has been, and if by the enactment and enforcement of just laws we throw the protection about the fisheries they need, and which the commonest intelligence must see is necessary for their preservation, we shall have ever ready at hand a wholesome food, abundant in quantity, cheap in price, that has grown to maturity, without cost or care.

Objection has always been raised by the opponents of the regulation of the fisheries, that we should secure co-operation from adjoining states and secure a uniformity of statute in all. The fallacy of this argument, so far as our own fisheries are concerned, is apparent. But if we admit that as the argument, would it not be an equally bad policy for the State to attempt to stamp out epidemic diseases, unless adjoining states would agree to take similar action? Facts show that Michigan has more value in her fisheries than any other adjoining state, and under such conditions the first duty of the State is to attend to its own material interests. It is no argument to say that because another state is willing to see its valuable fisheries carelessly wasted, that policy is good for Michigan.

The nonsense of this argument is also apparent, when we consider that the country lying opposite our border, having an extent of territory on the Great Lakes far exceeding that of our own and adjoining states, long since awakened to the necessity of conserving her fisheries. Without taking advice from her neighbors or awaiting their action she went sturdily, forcefully and promptly to work to enact regulations which have resulted in preserving her waters to a point where her fisheries are more profitable than our own. We refer to the Dominion of Canada, whose fisheries have been watched over and cared for by men keenly alive to their importance and the necessity for their preservation. Her territory is opposed to our own on our entire eastern coast and to the greater part of our Lake Superior coast.

The extent of our coast adjoining Ohio is small, but that state has passed more laws for the protection of her fisheries than our own and so has Minnesota. Wisconsin has but a small amount of border compared with ours and her fisheries are insignificent in extent or value with Michigan's.

Illinois has ceased to be a fish producing state. So has Indiana, which has but a fragment of frontage on the great lakes. Both of these states have permitted their fisheries to be destroyed without an effort to prevent it. So there can be no expectation they will take action in this regard.

Canada protects her fish by the imposition of a close season for all the lakes, of the month of November, which is the great spawning month of the whitefish and salmon trout. She also prescribes the number of pounds that may be set in a string, the number of strings in a locality, the size of the mesh, the distance nets shall be set from shore, and the manner in which they may be set in channels. She also imposes a license upon nets and boats, and in other respects exercises a complete control over an industry she appreciates to be of great material value.

A glance at the map herewith submitted will show that if there were anything in the argument, that we should wait on our neighbor, we need no longer wait, for our greatest neighbor and the one most interested in the fisheries long ago took the necessary steps to protect herself.

Canada, next to Michigan, is the largest breeder and planter of commercial fish in the lakes, so whatever advantage she may derive from our work is, in a large measure, realized by us from her enterprise in this respect.

Given an equal area of land and water, the area of water can be made to produce the larger quantity of food. And so far as the effort of man is concerned in the production of these areas, the advantage is largely in favor of the water.

Man fertilizes the soil, prepares it for the seed, sows his crop, tills and watches it almost continuously until the harvest. Man sows his seed in the waters, but he neither tills nor watches the sowing. The food upon which young fish live and thrive is ever present and ready for their wants. It is there without man's intervention or aid. When the harvest is gathered the sower finds a rich reward that has cost him comparatively little expenditure of money, care or attention.

The State has taken pains to surround the game fish, like the brook trout, the game birds, and the game quadrupeds of this State with the most rigid laws protecting them from interference during their period of reproduction, and for a sufficient time thereafter to protect the young until they can care for themselves; yet the State has not invested a single dollar in the propagation of any of these, except the brook trout, neither does it derive any substantial return from their capture. Stringent laws have been passed and are rigidly enforced to protect the peach orchards of the State from the scourge known as the "yellows." Such laws are just, and have been adopted and are rigorously enforced in the interest of the public good; but the great commercial fisheries of the State that yield a million of dollars yearly at the wholesale price, are constantly subjected to the most destructive methods of fishing, with the certain prospect that in a short time they will become absolutely extinct. If there is any one thing in the State that deserves protection, it is the commercial fisheries. It is not only a matter of the greatest concern to our present population, but it is of vital interest to those who are to come after us.

The duties laid upon the State Board of Fish Commissioners require them to submit a report to the Governor of the conduct of their work, and further requires them to submit suggestions from time to time as to the needs of the fisheries. In pursuance of this duty we have frequently suggested such reforms as seemed to us necessary and proper, and have asked for action thereon. We have no interest beyond that which concerns the public; and although such proposed measures may be defeated, our plain duty and our inclination, when possessed of all the facts, urge us to again bring this matter to your attention.

We recommend that at the coming session of the legislature a bill be passed authorizing the imposition of a license fee upon all nets which may be hereafter fished in the great lakes and their connecting waters in Michigan, and that the fund obtained from such licenses shall be turned in to the credit of the State Board of Fish Commissioners, to be used in the propagation of fish for stocking the waters of the State.

The state of New York has a law now in force similar to this, licensing the use of the oyster beds within the state jurisdiction. The Dominion of Canada has for years imposed a license on nets and boats engaged in the fisheries, and the states of Ohio and Minnesota have imposed license fees on the fishermen. The wholesale commercial fish business carried on in this State is to a certain extent in the hands of individuals and corporations living outside of the State, who come into our waters and enjoy the privilege of fishing here in common with our citizens, and it seems but just that they should contribute in this way to the support of the work of artificial propagation.

The work of the board has been chiefly directed to the propagation of the fish that are indigenous to our waters, and the propagation of such fish is more likely to be successful than to attempt the introduction of foreign species.

A surer result is obtained in fish culture where natural conditions are regarded in planting, by putting into our lakes and streams such fish as are naturally found in them. The conditions of an abundant supply of fish food for the fish so planted and of the right kind, is more likely to be found, and success is more certain than in attempts to introduce new varieties into strange and new surroundings, where fish food conditions are unknown.

During the past twenty-five years many attempts have been made by commissions and individual fish culturists to introduce new species of fish into the waters of this country. Many of these attempts have been failures. It may be and probably is the fact that too much of the work has been done without thorough preliminary inquiry having been made as to conditions of fish food in the waters where they have been introduced, the life history of the fish itself, and other things, which, if known, might have saved useless expenditure of time and means, and chance of failure.,

Our experience with our own waters has shown, however, that the much abused and despised carp has come to stay, whether welcome or not. Much of the criticism devoted to this fish has grown out of a lack of knowledge on the part of the general public as to his status as a food fish, and an increasing prejudice among those who think that every new fish must be possessed of the gaminess of the brook trout or bass, coupled with the edible qualities of our best fresh water fish. A fish may possess none of these game qualities and yet be of much economic value, and such a fish in our estimation is the carp. He is a foreigner, but never has a foreigner more readily adapted himself to his new environment than the carp.

It is a vegetarian in habit, and in foraging for the roots of aquatic vegetation he stirs up the mud of the water he inhabits, and the mistaken idea has gone abroad that he is a scavenger and uncleanly in habit. Nothing could be farther from the truth. With greater propriety might this criticism be applied to the hog, whose habit as to uncleanliness is proverbial, and yet pork is one of our chief articles of daily diet in some form or another.

In Europe for centuries the carp has been highly esteemed and was regarded as the food of kings, and great pains were taken in their breeding and care. Today it is highly thought of in Germany, and when it becomes better known in America, it will be more highly valued.

The carp is forceful enough to make head however against unreasoning prejudice. His flesh is coarse, but outranks the flesh of the coarser varieties of our native fish, like the pike, sucker, red horse, moon-eyes, etc., of which large quantities are annually consumed.

Figures tabulated from the New York market reports extending over a number of months show its selling price to average about six cents per pound. It is also true that it fetches a good price in the Philadelphia and Washington markets. An inquiry made last year by this board among Detroit fish dealers showed that the amount disposed of in this market reached seventy tons for the year.

Singularly enough the carp that reach the Detroit market have come into the great lakes as the result of an accident. The board has never deposited a carp in the waters of the great lakes. But several years since distributions of these fish began to be made to applicants in the interior of the State to be placed in spring holes and in the sources of spring-fed streams. The applicants constructed what they called dams for the confinement of the water and the fish. Matters went on in the even tenor of their way until some passing summer cloudburst or autumnal freshet carried away the frail barrier and water and carp escaped into the stream and were lost to the proprietor. But the public was the gainer by this natural distribution. The fish gradually dropped down the stream to some larger current and eventually found their way by the Huron or some other stream to Lake Erie.

We assert that the people will look upon this fish with more favor as it becomes better known. We are also satisfied that it will become an important and cheap food for the poorer class of people who cannot afford to buy the more expensive kinds, but can afford to have a Friday dinner off the cheap and good foreign fish, once considered fit only for royalty.

A recent writer in the daily press, in discussing the carp, has written very intelligently on the subject, and we quote him in this connection.

"These are the days of bluff and bluster; of rank intolerance and unreasoning prejudice. A newspaper scribbler who could not for his life tell whether fish eggs belong to the animal or the vegetable kingdom, or 'half way between the two,' as expressed recently in a Philadelphia exchange, starts an absurd rumor about the carp as a destroyer of game fish and their eggs, and men whose duty it is to know better join in the hue and cry.

"Many years ago a German named Poppe, residing in California, introduced a few carp from his native country to his adopted home, and, in a few years, the fish were spread in many parts of the state and had been transported to the Sandwich Islands. Less than twenty years ago the first United States Commissioner of Fisheries obtained some of the same species from Germany for stocking suitable waters in the United States.

"Both Baird and Poppe were well aware of the esteem in which the carp is held in Europe and of the great industries springing out of its culture in ponds. Each was animated by the praiseworthy desire of acclimating this valuable fish in portions of the country which were not well supplied with choicer fishes. The primary object of its introduction was to furnish a species that has a record of successful domestication, rapid growth and good food qualities under proper conditions.

"Owing to the fact that carp could be had for the asking and to the misapprehension that they can be grown in any kind of water, the fish were distributed throughout the whole country for stocking ponds; often poorly made, from which, in innumerable cases, they escaped into open waters. Many of them also were intentionally planted in streams. In this way the carp has become abundant, and, in some localities, it is very much abused.

"It is said to be worthless for food and a destroyer of game fish and their eggs, as well as of the water pants upon which wild ducks feed. Carp will eat the bulbous roots of water plants without doubt, but there is ground for more than a suspicion that ducks were driven from the marshes near San Francisco by drift nets rather than by the feeding habits of the carp. It is surprising that the newspaper ichthyologist has not charged the big carp at the mouth of the Susquehanna with the destruction of the wild celery beds and the consequent scarcity of canvas backs. Fortunately, the cause of the disappearance of the celery is too widely known to warrant the charge.

"Does any one seriously entertain the belief that a fish like the carp, without teeth in its jaws and with only a pair of weak comblike laminæ in its throat, can seize and destroy a game fish? As a matter of fact, the game fish find in young carp a never failing and ever welcome addition to their food supply. Has any one found eggs of any sort in the stomach of a carp? We have yet to see the first authentic record of it. But, even if it be true as stated, the carp is no worse than the rainbow, the lake trout, the Dolly Varden and some kinds of salmon; it is certainly not trout, the Dolly Varden and some kinds of salmon. We hear no outcry against these noble game fishes and this valuable commercial species because of their well known failing.

"The carp, when in season, is a good fish, and it is marketable at a fair price, comparing in this respect with pickerel, pike, perch, cod, eels and the red horse in the winter season. At Quincy and Chicago, Ill., Sandusky and Cleveland, Ohio, Philadelphia, Baltimore and Washington, to our certain knowledge it is held in good repute. A prominent restaurateur in Cleveland puts it on his bill of fare alternately with whitefish, and he says he has as many orders for carp as for whitefish. That it is winning its way in Philadelphia is shown by the following item from the 'Philadelphia Times':

"'The much despised carp is proving itself a most valuable food fish, as well as a money getter, and work in catching them in the streams of Salem county, N. J., continues on a large scale, notwithstanding the ice. Fish culturists state that carp hibernate in the mud during the cold weather, and experience apparently does not bear out the assertion, as many are now being caught. Holes are cut through the ice and a net cast, and hauls made every half hour. The fish are worth five cents per pound and the supply will not begin to equal the demand. In quality they taste much better now than in the summer, and they are considerably larger. One firm in Philadelphia has paid to men in Penn's Grove over $3,000 since last July, while fishermen in Upper and Lower Penn's Neck have received $5,000 for their past six months' catch. Three firms are now buying them.'

"In Quincy, Ill., many hundreds of poor families would go hungry but for the obliging carp introduced by the Fish Commission, and now so plentiful as to add materially to the food supply.

"But it is not to be expected that arguments based upon the use of the carp for food and its value to the commercial fishermen will avail to stem the torrent of abuse now rolling and surging on the shores of lake and stream, and echoing and reverberating in shallow caverns which are the empty heads of its false accusers. What does it matter whether the poor have bread and the toiler has his recompense so long as the know-it-all scribbler has his fling!"

The rainbow trout (salmo irideus), a native of the Pacific coast streams, has thriven remarkably well in our rivers of large volume. It is a vigorous and sturdy game fish, and grows to larger size as a rule than the brook trout (calvelinus fontanalis). One of the interesting things regarding this fish has come recently to our attention. Two excellent individuals of this species have been taken in nets engaged in commercial fishing in the great lakes during the last year and a half. On or about July 15, 1895, a rainbow trout, weighing 5½ lbs. and in prime condition, was taken in one of the nets of Messrs. Ainsworth & Ganley, fishermen of Sault Ste. Marie, at the Lizard Islands on the north shore of Lake Superior. This is the first reported rainbow trout taken in the great lakes.

The second individual was caught in a pound net fished by Mr. Samuel Butterfield at the Cheneaux Islands, September 29, 1896. This fish weighed 3 lbs. 2 oz., and was also in perfect condition. On the following day it was sent to the Sault Ste. Marie hatchery alive, and placed in a pond where it remains in fine condition.

From this we may infer that the rainbow takes kindly to the upper lakes, and it is possible they may increase in numbers sufficiently in time to afford excellent sport to the anglers on those waters. This fish has no superior among trout in our waters for gaminess, and is a desirable fish in every way. His advent in the great lakes so far as we know is similar in manner to that of the carp. None have been liberated in any of the lakes, and he comes undoubtedly from some of the streams of this or neighboring states which have received liberal stockings. Our experience for the first few years in handling this fish was not satisfactory. They did not manifest themselves in the smaller streams after liberation, although in larger streams they succeed well, and it was inferred that they preferred more ample limits for success and passed into larger waters. Their capture in the great lakes seems to verify this view, and it is to be hoped that they have found in the pure waters of Huron and Superior a congenial habitat.

The work of the Division of Scientific Inquiry established by this board, which was in operation for more than two years, was dropped at the beginning of the biennial period covered by this report, because of lack of funds with which to prosecute the work. It was unfortunate because the work had been well organized, and the cost of its maintenance was comparatively small. The division was organized primarily for the purpose of investigating the life habits of the young whitefish, the foods upon which it lived, where it was found at different seasons and in what varying conditions of abundance. The determination of the conditions that controlled their movement, whether food, temperature, or other causes, are all of great importance to the fish culturist, as much so as an intimate knowledge is essential to the agriculturist of a knowledge of the conditions of the soil and its constituents. A thorough knowledge of these things would aid in determining whether one locality afforded better chances of success for the growth and life of the young fish planted. Incidental to such investigation many collateral investigations are demanded, which though seemingly not closely related to the main investigation, are as a fact essential to a full knowledge of the subject in order that just deductions may be made bearing upon the questions to be solved.

It is to be regretted that occasion arose making it necessary to drop this work, after it was once well under way and the force had been organized, and it will be a matter of some difficulty to again bring together so efficient a corps of investigators again, but we hope to be able at an early date to again start on this valuable enterprise. The work thus far done has been of practical and scientific value. We have found a locality well suited for the continuation of this work, where constant supervision during the year may be had over the fish to be examined, and with a small outlay of means a permanent station can be here established. Should our funds warrant we hope soon to again begin this most important work. (*a*) Five bulletins, embracing reports of the work of the different divisions under this bureau, have been issued in the last biennial period. These bulletins have challenged the attention of scentists at home and abroad, and have added to the stock of common knowledge on the subjects of which they treat.

The growing scarcity of salmon trout in the lakes compels us to recommend that the artificial propagation and distribution of this fish be entered upon. The importance of this fish in the market is next to that of the whitefish. Charlevoix is the center of the best salmon trout grounds on the lake system, and affords advantages over any other point. It is near large spawning beds and distributions of fish can be made at small cost, and with prospects of excellent success.

The citizens of Charlevoix have expressed themselves as interested in the establishment of such a station, and if they will contribute to the board a site and a sufficient water supply for the station, we think the State should provide sufficient funds with which to erect and properly equip a hatchery. The cost of buildings and equipment will not exceed five thousand dollars and would repay the investment.

In the spring of 1893 we established an experimental station for the hatching of small-mouthed black bass at Cascade Springs. The multitude of inland lakes in this State show the effects of overfishing and the greater number of them require restocking. There were some questions to be solved regarding the hatching of this fish, and its action under domestication. The three years of experiment at this station have shown that with proper methods the work can be made successful, and that it should be brought to its fullest possibilities. When it became known that this work was under way, applications began to come in and those now on file in the office would exhaust the capacity of a large station. No other new work undertaken by the board has met with greater favor than hatching and planting of black bass. The bass is natural to nearly all our inland lakes and many of our streams, and is so well and favorably known that the work of restocking our inland lakes with this fish has met with popular approval.

We have secured a very advantageous location for a new bass station on the line of the Chicago & West Michigan Railway, near Grand Rapids, at a very low figure, and shall commence the construction of the necessary ponds with the opening of spring. The expense for the completion of this station will not be large. It is quite likely that if the demand for black bass increases at any such rate in the next five years as it has in the past two, there will be a necessity for equipping other stations in different parts of the State to meet these applications.

The board has decided to discontinue further distributions of gold fish. They are in no sense a food fish, and being used solely for the purpose of display, we shall hereafter discontinue donations of this kind, except to a few of the public parks.

For the purpose of making distributions of young whitefish in localities where the best results may be secured, we have made every investigation possible to ascertain the exact location of the natural spawning beds of the whitefish in the great lakes of this State. The most careful inquiries have been made of fishermen on different parts of the lake coast, and the information thus gained has been made a matter of record in the office of the board. This information has been put in shape and furnished to the captain in charge of the car for his guidance in planting. Special care has been taken to impress upon those charged with this work the importance of putting the young fish on grounds indicated by the fishermen as the spawning beds, and these directions have been fully carried out. In doing this the board is following out nature's plan in liberating the young fish on the beds where the fish naturally spawn, and we believe with the best chances of finding the natural food taken by them at that age.

In nearly all instances where tug service is performed in connection with the plant, it has been done by the local fishermen of the port from whence they have been distributed, and they have been directed to take the fish to the places we desire to reach, and in case of doubt as to the locality of a spawning bed, their advice has been asked for. In nearly all instances this tug service has to be paid for by the State, and in the course of a year amounts to a considerable sum. Often the owner of the tug is the principal beneficiary of the work done by the State in planting fish, and it would seem that such service should be rendered gratuitously, yet no such disposition has yet been manifested.

In January, 1894, the term of Mr. Hoyt Post as commissioner expired, and Mr. Freeman B. Dickerson of Detroit was appointed his successor.

DETROIT STATION AND RIVER FISHERIES.

BY SEYMOUR BOWER.

The last biennial report of the operations at this station covered a period ending December 31, 1894. At that time the hatchery contained probably the largest and finest lot of whitefish eggs ever assembled under one roof. The capacity of the hatchery for green eggs was overreached, compelling the immediate shipment of a considerable surplus.

The weather conditions had not been the most favorable for a large catch in the river, as storms interfered to some extent with the fishing, but were exceptionably favorable to induce free spawning and a high percentage of fertilization. On November 13 the temperature of the river had dropped to thirty-eight degrees, and it did not rise above that point again during the remainder of the season; so that at least ninety-five per cent of the females spawned were handled from water ranging in temperature from thirty-eight down to thirty-four degrees, the best possible range to secure the most favorable results.

There were shipped from the Detroit hatchery during the season a total of eighty million three hundred and thirty-eight thousand whitefish eggs. The last lot went out February 20, completing a transfer of 33,000,000 to the branch hatchery at Charlevoix, to be hatched there and placed in northern Lake Michigan. On February 25 a careful measurement was made of the eggs remaining at Detroit, showing 94,987,000 on hand. At that time the eggs were all eyed and the dead and unimpregnated had practically all been eliminated.

The hatching season opened several days later than usual at this station. Generally a sufficient number of fry are out to make one or more shipments in March, but as late as April 8 this year the water was down to thirty-four and one-half degrees, or only one and one-half degrees above the lowest point reached during the winter, and it did not go up to forty until the 16th. Notwithstanding the low temperature, a sufficient number of the oldest eggs had hatched by April 6 to enable us to collect from all the tanks a light carload of fry, and the car was accordingly started on that date—just twenty-three days later than the first shipment last year. The eggs hatched freely and quite steadily from and after the 10th and the hatching season closed seventeen days later, or April 27.

The total number of fish hatched and planted at this hatchery was 93,400,000, shipped out in 2,931 cans. The number of eggs laid in was, in round numbers, 188,000,000, portions of which were shipped away in the eyed condition as above stated. Comparing this number with the total output of eggs and fry, we find that the percentage of results was ninety-two and one-third. It is hardly fair, however, to regard this as the hatching percentage for, although the greater portion of the eggs shipped were cleaned up and in the eyed stage, some went out as green eggs, or before the percentage of loss had been sustained. Making the average allowance for losses on the latter, however, we find that the actual hatching percentage was a trifle over ninety.

In all cases the fry were planted in a vigorous and healthy condition, wholly without losses either in the tanks or in transit. This result was due chiefly to the fact that the fish were shipped practically as fast as hatched, thereby forestalling weakness and exhaustion for want of food. The tanks were alternately emptied and cleaned every two or three days, thus insuring against holding any fish longer than three days.

When we consider that nature, although generous to the female whitefish in the number of ova, leaves that ova when naturally cast entirely unprotected and exposed for months to manifold agencies of destruction, the enormous saving and multiplication of results through the manipulation and protection called artificial propagation, are at once apparent, but in the propagation of whitefish on a large scale the great advantage of art over nature is reversed at the hatching point. We have suddenly thrown on our hands millions of young animals that must soon have food. The question is, shall we attempt to supply this food ourselves, or release them where nature has provided an abundance.

The suggestion is frequently made by visionary enthusiasts that whitefish fry should be confined and fed until they have obtained some growth. It is true that they may be reared under surveillance on their natural food or a substitute, but the percentage that may thus be raised is so insignificant that the labor and expense are entirely out of proportion to the results. The question of cost, coupled with meagerness of results, precludes consideration of the plan. It is not only impracticable to provide the storage tanks or enclosures that would be required to carry fifty to one hundred millions of fish—presupposing it possible to keep a profitable percentage alive and growing under the restrictions necessarily imposed—and to collect the volume of natural food necessary for their sustenance, that such a course seems wholly unnecessary and unwarranted. Under natural conditions and limitations, the only practical and rational plan is to release them at once where they may disperse and range at will in the waters of the great lakes, nature's great free store house, inexhaustibly stocked, not only with the minute animal forms that constitute their earliest food, but also with the larger and varied forms essential to successive stages of development.

Having done all that we can do with profit when we have brought the embryos to the point of hatching, the question of how much longer they should be held, without any attempt at feeding, becomes an important one. Whitefish fry, as such, are never more vigorous than at the time of hatching; they are free swimmers and begin to take food within a very few days. It would seem, therefore, that the sooner they are set free in their native habitat, to mingle with nature's fry, the better. There is nothing to be gained by holding them and there is great risk in carrying them beyond the time when nourishment other than that supplied by the food sac is essential to normal development.

The question of liberating the fry to the best advantage with reference to food supply and other favorable conditions also seems an important one, and the aid of scientists might well be invoked to throw more light on this and kindred questions.

The volunteer work on the great lakes by a corps of scientists in the summer of '93, and again the following summer, contributed much that is of interest and practical value to the fish culturist, but to acquire the greatest measure of knowledge of a practical nature, these investigations should be continued in time and extend over a wide territory, so that the life history of all forms of water life under all the varying conditions of environment, and the relation and interdependence of these forms might, as far as possible, be known.

For example, it is entirely feasible to determine approximately—aside from the destruction wrought by spawn eating fishes—the hatching percentage of whitefish eggs in a natural state, and thus demonstrate conclusively the relative merits of artificial and natural production. Collections from the spawning beds from time to time during the spawning season would show the natural percentage of fertilization, while later collections would show the loss to the eggs from sediment and the insidious spread of fungus. But this, of course, cannot be done in the summer. Nor can the range and abundance of the earliest food forms selected by the infant whitefish be determined in summer, when the temperature of the surface levels has gone to the opposite extreme.

We know that whitefish fry do not take their food from the bottom; from the moment of hatching they are free swimming animals, whose earliest food consists of other free swimming animals. If this food is more abundant in one locality than in another, we should know it. If there are areas having no food for the young fish, and other regions of great fertility, we should be able to define them. If, on the other hand, we find that there are no barren areas to be avoided, that the food is distributed with a considerable degree of uniformity, then our aim and solicitude would lie chiefly in the direction of releasing the fry where they would be least likely to fall a prey to natural enemies.

While it is not known whether the food of the fry is any more or any less abundant within easy range of the reefs and shoals selected by the adults for spawning purposes, and while the best place to plant them is, for want of definite knowledge as to food conditions, largely a matter of conjecture, the reasonable supposition is that they should be placed only over spawning grounds. Partly in deference to the prevailing notion, and partly because it may be said in defense of this course that when so planted the hatchery fry are at least on an equal footing with nature's fry, the distributions have been confined as nearly as possible to spawning sections. In Lake Michigan only two lots were liberated south of Frankfort, as the spawning grounds south of a line crossing the lake at that point are few and unimportant.

By taking advantage of the great natural fecundity of the whitefish in connection with the adaptability of the embryos to artificial propagation, hatching results are multiplied enormously; likewise it seems not improbable that there are other conditions within the realm of discovery which, if taken advantage of, would enable us to still further discount nature.

When we consider the character of the spawning grounds, that such grounds are practically destitute of vegetation and therefore wholly unfavorable to the development of fundamental water life, it would seem that nature directs the parent whitefish to certain grounds solely with a view to the protection and welfare of the ova, not the fry. The character of the bottom is a matter of some consequence to such kinds of fry as are helplessly weighted down with a heavy food sac, but the whitefish is not thus handicapped; it rises and swims freely the moment it escapes from its embryonic prison. From a condition of utter helplessness, except such incidental protection as the formation of the bottom may afford, all impedimenta is suddenly thrown off, and there is set free a little animal whose immediate future is in no-wise related to the nature of the bottom from which it arose, except as the latter may have a bearing on the abundance or scarcity of food in that vicinity.

The nature and formation of the bottom or grounds where whitefish spawn also constitute a strong argument in support of the proposition that the spawn is deposited in nature wholly with reference to the ova. It is cast on reefs and ledges of limestone rock, sometimes honey-combed and resembling a petrified sponge in form, sometimes on a solidly paved cobblestone bottom, the latter sometimes interspersed with boulders. So far as is known—and the territory has been pretty thoroughly canvassed throughout the great lakes—ripe whitefish of both sexes may be taken at the same time only from grounds of his character. Indeed, it seems almost necessary that grounds of this nature must be used if any of the ova are to survive or escape the many dangers with which they are beset for a period of five or six months, as the cells of the honey comb reefs and the interstices and crevices between the cobblestones afford some degree of isolation and immunity.

Many fishermen assert that whitefish are strictly local in their habits, that they only visit certain feeding and spawning grounds and never range beyond these limits. This may be true where good feeding and spawning grounds are adjacent, but it hardly seems likely that where such grounds are widely separated the same invariable path between the two is always taken. However that may be, the fact that certain types visit certain grounds year after year has given rise to the absurd notion that the fry from hatcheries should at some future time return to the exact spot where planted, and if they fail to do so, whether whitefish have ever been taken in that locality or not, the whole work of propagation is condemned and denounced as a failure. When planted on spawning grounds there may be some reason to expect them when mature to visit the spawning grounds of that neighborhood and to continue to do so indefinitely—if not caught before they have had an opportunity to do so—but when deposited elsewhere and wholly without reference to spawning grounds, surely the reproductive instinct will never bring them to a point of planting again unless it lies directly in the path towards a spawning ground; and though every fish so planted survive to maturity, it would be the merest chance or accident if that particular spot were visited or passed while foraging for food. An impartial estimate of the results of planting over wide areas must include the catch of a lake as a whole, considered in conection with the nature and extent of the fishing. A fair index of the tendency towards an increase or decrease in the number of adults is afforded by the number that annually assemble, or that attempt to assemble on the spawning grounds. Seized with a common impulse they move instinctively towards the reefs and stony sholes for a definite purpose; but the claim that fry planted indiscriminately over wide areas should return unerringly to the exact spot where set free, seems almost too absurd to find support.

During the summer of 1895 the inside of the hatchery was painted two coats throughout, and the entire jar and tank equipment was torn down and reconstructed. The fry tanks and one of the double jar batteries were rebuilt wholly of new material, but the other jar battery was made up of troughs and tanks culled from the old material and patched and repaired. The inside joints and corners and seams of all the tanks were filled with hot pitch; then the whole inside surface was treated with three coats of coal tar.

DETROIT RIVER FISHERIES AND WHITEFISH WORK. SEASON OF 1895-96.

Only three fisheries were operated by the commission this fall—one at Grassy Island and two at Belle Isle. The fishery at Stony Island, now run by private parties, was a failure on account of the extreme low stage of the water in connection with the peculiar local conditions at that place. The fishery in front of Fort Wayne and known as the Fort Fishery, from which we have usually secured 15,000,000 to 30,000,000 eggs each season, is lost to us irrevocably through the action of the government in parking the river front and demolishing the fishery. The buildings and platforms at this fishery rested on piles, about twenty rods from shore, and the grounds that they occupied are now just inside of the sea wall that has been laid to define the new shore line and enclose the new park area. Notice to vacate was received in September, and soon after a crew was sent there to dismantle the buildings. These were of little value, except the one used as quarters for the fishing crews, which was nearly new, and this was transferred by scow to one of the Belle Isle fisheries, where it was needed. All other material of value was likewise taken to the Belle Isle fisheries.

Following the removal of the Fort buildings, a crew under the direction of Dwight Lydell as foreman, was put on at Belle Isle to make necessary preparations for the fall fishing. The seines that had been stripped and stored since the preceding season were overhauled, mended and hung, and three new ones added. A number of the old crates were beyond repair; the new ones to replace them were made considerably shorter, for convenience in handling. The usual roughly constructed temporary buildings, docks and platforms required at the two Belle Isle fisheries were provided. As the construction and dismantling of these temporary necessities each season involves considerable expense and waste, it is to be regretted that sufficient funds are not appropriated to provide for their permanent construction, finished and ornamented in such a manner as to meet the approval of the Park Board, so that their removal would not be required each year on account of crude and unsightly appearance. This would not only be more economical in the long run, but also more desirable in every way.

At Grassy Island a crew commenced work October 8th, to make needed repairs to crates and seine boats and to do the necessary dredging to remove the annual accumulation of mud from the ground in front of the apron and out toward the channel bank.

Preliminary or trial hauls to clear the grounds and to note whether the fish were running were made occasionally by the repair crew. Fishing by a regular crew was begun at Grassy Island October 17th, at the Willis Fishery at Belle Isle on the 18th, and at the East Point Fishery, Belle Isle, on the 21st. The crews were doubled at the Grassy and Willis stations on the 29th and at East Point a day later. The bulk of the run came on about a week earlier than usual, and fishing was discontinued at a correspondingly early period. The last hauls were made at Grassy on the 16th of November, at the Willis Fishery on the 17th, and at East Point on the 18th.

The season as a whole was favorable as respects fishing, but unfavorable for spawning. The cold, rough weather that prevailed throughout the month of October brought the fish into the river early, but they were not ripe, and the fine weather that followed was not at all favorable to maturing the spawn of whitefish confined in crates. The water temperature had dropped gradually to 40 degrees by November 1st, and the conditions were all right up to that time, but instead of going lower, or even remaining stationary, as it should to have forced the spawning, it rose to 46 degrees by the 7th and did not drop back to the 40 notch again until the 19th. A comparison of the water temperatures with those of a corresponding period last year affords a complete explanation for the difference in spawning results.

The combined catch of the three fisheries was considerably greater than from the same grounds last year. Grassy Island shows a decrease, and the Willis ground a slight increase, but the catch at East Point was nearly doubled. A very unusual feature of the season's catch was that the females outnumbered the males. More of the former were taken than last year, although one less fishery was operated.

At Grassy Island low water was responsible for delays that reduced the total number of hauls during the season about 25 per cent. Frequently the water in front of the apron was too shoal to float the boats after the seine had been shipped, causing a considerable loss of time in getting away. The average catch per haul was, however, 15 per cent greater than last year. The largest single haul of whitefish at Grassy during the season was 62.

At the Willis Fishery the number of hauls was 16 per cent fewer than last year, due to an increase of 16 fathoms in the length of the seine, thereby requiring more time to ship and to land it. The average per haul was 20 per cent greater than last year. The largest single haul was 37.

At East Point 28 more hauls were made this year than last and the increase in the average catch per haul was 73 per cent. Largest single haul, 57. The service at this fishery was very satisfactory this season. A special watchman was stationed there during the season and a more skillful seine thrower was secured for the second crew.

The following table shows the season's catch in detail:

Fisheries.	No. hauls.	No. females.	No. males.	Total.
Grassy Island	470	2,941	2,323	5,264
Willis (Belle Isle)	677	2,198	1,833	4,031
East Point (Belle Isle)	437	1,697	2,531	4,228
Totals	1,584	6,836	6,687	13,523

On the night of November 26th a heavy southwest gale lowered the water at Grassy Island about six feet, breaking all low water mark records. As our crates there rest on the river bed, it was thought for a time that most of the fish would have to be taken out. The females that had not spawned and most of the males were moved to crates some distance away in deeper water, placed there expressly to meet such an emergency, but even there the water was dangerously low. For a short time there was less than a foot in the crates and many of the fish were partly out of water, but the tide turned barely in time to save them.

A few eggs were taken as early as November 1st and as late as December 12th, but the heart of the spawning season was between November 8th and December 1st. Number of females spawned at Grassy, 2,476; at Belle Isle, 3,103; total, 5,579. Number of females at Grassy that failed to spawn, 465; at Belle Isle, 792; total, 1,257. Average per centage spawned .816, or more than 11 per cent less than last year.

The total number of eggs taken on the river was in round numbers 169,000,000, an average of about 30,500 per female spawned. Another million was received from other sources, making the total receipts at Detroit about 170,500,000, or 18,000,000 less than last year. Belle Isle furnished 16,000,000 more this year than last, and Grassy 4,000,000 less, a net gain of 12,000,000 from these sources; but contributions from two fisheries that furnished 31,000,000 last year were entirely cut off this year, leaving a net loss on the river of about 19,000,000.

The average weight of the whitefish taken this year was two pounds and fifteen ounces, an increase of 10½ per cent over last year and 20½ per cent over two years ago.

The following shipments of whitefish eggs were made from the Detroit hatchery during the season:

Nov. 25, 600 quarts to Charlevoix.
Dec. 12, 300 " "
" 20, 382 " "
" 30, 231 " Sault Ste. Marie.
Jan. 19, 200 " " "
Total, 1,713 quarts, or nearly 63,000,000.

The 600 quarts shipped November 25th to Charlevoix were all lost through the wrecking of the fish car near Traverse City.

By March 1st the eggs were cleaned up and in fine condition. A few fish were observed in the tanks as early as March 13th, but the hatching season cannot be said to have commenced until the 25th. The weather remained cold for a number of days, however, and the hatching was retarded. Only about 5,000,000 had hatched up to April 8th, on which date the car was started. After that the water warmed rapidly and the eggs were all out on the 18th. The last shipment of fry was made on the 22d. The fry were shipped and planted in excellent condition, the plan of the past two seasons being continued, namely, clearing and cleaning the tanks alternately as often as once in three days. Total number of cans shipped, 2,378; number of fish, 66,000,000.

It has been freely claimed and with considerable persistence that the water in which the eggs are incubated at the Detroit hatchery is warmer than the water in the river, on account of being piped about two miles, and that in consequence the eggs hatch earlier than in nature; but the record of surface and bottom temperatures of the river that has been kept during the past season proves the falsity of this claim. The hatchery and river temperatures are practically identical. Still further and equally conclusive evidence is furnished by the fact that the incubating season at the Sandwich hatchery, which is located on the bank of the river and pumps directly therefrom, is identical with ours.

RIVER FISHERIES AND COLLECTION OF WHITEFISH EGGS, SUMMER AND FALL OF 1896.

During the summer the little building moved from the Fort Fishery last fall to the East Point Fishery, Belle Isle, and used as a mess house and sleeping quarters for the fishing crews, was remodeled externally, and converted into a neat little cottage similar to the one at the Willis Fishery.

On September 15th the crew commenced overhauling seines at Belle Isle. Some of the seines were badly torn and worn, but it was decided that with four new strips they could be made to answer for the season. The repair force was increased October 1st and the usual work of building docks, platforms, etc., was taken up.

A number of new and improved crates were made for the Belle Isle and Grassy Island spawning stations, the new features being suggested chiefly by Foreman Lydell. Two and one-half inch strips were used instead of six inch fence boards, thus increasing the area of the openings and improving the circulation. For convenience in moving and storing, the new crates are bolted instead of nailed at the corners, so as to "knock down" into five sections—the bottom, two ends and two sides. But the most important improvement introduced is a false bottom which can be raised or lowered at will. This bottom is made of two and one-half inch strips and is held down by wooden pegs passing through an upright standard at each corner into the corner post. When the pegs are pulled, the bottom floats up to the surface; or, it may be stopped and held securely and indefinitely at any intermediate peg station. Heretofore in handling a crate of fish, they have been massed towards one end of the crate by a sliding gate, but when the water is so roily that only those near the surface may be seen, quite a good many are overlooked and escape handling at the proper time. The gate is still used, but the movable bottom still further contracts the lines and brings every fish into view, regardless of the condition of the water.

Early in October a repair crew commenced to lower the platform at the Grassy Island fishery and to make other preparations for the fishing season. The object in lowering the platform was to facilitate the handling of the seine. When this platform was built, the average stage of water was considerably higher than that of the past few years, and what is really needed now is an extension of the dock and platform into water of sufficient depth to float a loaded seine boat at all stages. Likewise the canal or runway connecting the apron with the crate should be moved farther out. As it is now, every southwest gale of any consequence lowers the water so that the canal is high and dry, and the fish have to be carried in tubs from the seine to the crates.

Regular fishing was begun at Grassy, October 20, at Belle Isle two days later, and the crews were doubled all around from the 27th to the 29th. Fishing was begun an average of one day earlier than last year, and was carried on five days later. The last hauls were made at Grassy, November 21, and at Belle Isle on the 23d.

The weather was unfavorable throughout the season for fishing on the American shore. Our catch was 16 per cent short, or 2,260 fish less than last year. High southeasterly to southwesterly winds prevailed almost continuously during the best of the season, interefering to a considerable extent with the proper handling of the nets, and also influencing the movement of the fish towards the lee or Canadian shore.

The catch in detail is shown in the following table:

Fisheries.	No. hauls.	No. females.	No. males.	Totals.
Grassy Island	626	2,228	2,366	4,594
Willis (Belle Isle)	814	1,550	1,697	3,247
East Point (Belle Isle)	578	1,458	1,964	3,422
Totals	2,018	5,236	6,027	11,263

A very few eggs were taken October 29, an unusually early date, and the soft condition of the females indicated an early spawning, but a long spell of warm weather followed and only 66 fish had spawned up to November 13th. After that the eggs flowed freely, as is usual, from the fish that were within a day or two of spawning when caught. The farther they are from spawning when taken, the greater the number that will fail to mature. Invariably a majority of the latter come from the early caught fish, and the defection is very largely increased with a rising temperature. Early caught fish are often brought almost to the point of spawning by a rapid cooling of the water, then a change throws them back so that many are never brought to that point again, while those that finally do mature are the very last fish stripped during the season. Probably more than 50 per cent of the females caught prior to November 2d, this season, did not mature their spawn.

A comparison of water temperatures during the three spawning seasons ending with the present forcibly illustrates the influence of range and rise and fall on spawning results, and proves the value of a low and narrow range as well as the adverse influence of a rising or relatively high stationary temperature. In the fall of 1894, 95 per cent of the females spawned were taken from a water temperature of 34 to 38 degrees; 93 per cent of the females caught were stripped and 90 per cent of the eggs hatched. The following year the water dropped to 40 degrees by November 1st, but rose to 46 on the 7th and did not fall back to 40 again until the 19th. The spawning percentage was 81½ and the hatching percentage 76. This year, from November 1st to 28th, the water ranged from 52 to 40 degrees, touching the latter point only once during that time, and averaging 45. The spawning percentage was 80 and, from present indications, the hatching percentage will be from 75 to 80, or about the same as last year.

Whitefish seem specially sensitive to temperature influences when confined and handled in crates. As more than 90 per cent of the females from the river catch are not fully gravid when taken, and must therefore be crated for a longer or shorter period, the significance of water temperatures as a factor is still further emphasized. It is fotunate for this work that a large majority of the females are taken after the fishing season is well advanced, the early runs being made up chiefly of males.

Of the 5,236 females crated, 1,048, or 20 per cent, failed to spawn. Total number of eggs taken, 149,650,000, an average of about 35,000 per female spawned.

The average weight of the fish was two pounds and thirteen and one-third ounces, a trifle less than last year. The females ranged heavier, but there was a considerable sprinkling of undersized males. A whitefish as small as one pound in weight has very rarely occurred in the river runs, but at Belle Isle this season 110 fish of one pound or under were taken. These, of course, were returned to the river alive.

The last eggs were taken December 16th at Grassy Island. The spawning season, however, was practically closed in November, as less than 200 fish were stripped in December. The Belle Isle station was closed December 12th. A sufficient number and variety of fish were reserved from the fall catch to maintain an aquarial exhibit at the hatchery through the winter. The conclusion of the river work, which resulted in placing an even thousand jars of whitefish eggs in the Detroit hatchery, closes the biennial period covered by this report.

PIKE PERCH (DETROIT HATCHERY).

As there were comparatively few applications for pike perch on file in the spring of 1895, and as the funds were short it was thought best to carry them over and discontinue this branch of the service for one or more seasons. Inquiries for suitable inland waters continued to arrive, however, and a sufficient number of applications had accumulated to warrant taking up this work in a limited way in the spring of 1896.

An effort was made to lease the fishing privilege on a well known spawning ground on the St. Clair river, but a prohibitive price was asked. The spawn was therefore secured at fisheries operated from Toledo. The ova was taken during the latter part of the spawning season, or from April 20th to the 27th, the spawning privileges having been controlled by others prior to that time.

At the time the eggs were arriving at the hatchery, the temperature of the water varied from 50 to 52 degrees. By May 9th it had gone up to 60 degrees, the weather being hot. The eggs developed rapidly and showed the eye spots on the tenth day. The oldest began hatching May 4th, the sixteenth day. Most of the entire lot hatched from the 6th to the 8th and all were out on the 9th. The average period of incubation was fifteen days.

On May 10th the fry began to rise and show up freely in the tanks. The weather continued hot and they developed rapidly, restricting the time of holding them in good condition to a shorter period than usual. Distributions were made by messenger, the car being engaged in important work in the upper peninsula. Two messengers were started May 10th and they made a total of eleven trips in six days. By that time, or on the 16th, the fry began destroying one another, and the tanks were therefore cleared and the fish placed in the Detroit river, near Belle Isle. In round numbers, 5,000,000 were planted in the river and 9,000,000 distributed by messengers, who made 34 deliveries for 49 inland lakes.

Pike perch fry for the most part lie dormant and apparently lifeless in the bottom of the tanks for a few days after hatching. In this state they are in no condition to be handled or transported. But within a few days after rising they begin to feed upon one another, so that the time for safe and successful transportation is too limited to admit of widely extended distribution. It would therefore seem to be a good plan to make partial distributions in the form of eyed ova, moving them to the waters to be stocked and hatching them "on the spot" in floating boxes.

The following communication was recently received from Mr. G. W. Jones of Marcellus, Mich.:

"The fish you have sent me from time to time have proven valuable in stocking our lakes and streams in this vicinity, and especially is this true in regard to the pike that were furnished several years ago for Big Fish Lake and Saddle Bag Lakes. Our local anglers are catching a good many this winter through the ice and they weigh from three and one-half to seven and one-half pounds each."

NOTES ON EXPERIMENTS IN FEEDING WHITEFISH FRY ON THEIR NATURAL FOOD.

In the spring of 1895, a few simple experiments were inaugurated on a small scale with a view to noting at what age the fry begin to take food, also to determine the particular forms taken by natural selection during the earlier stages of whitefish life. A number of lots of one hundred to three hundred fry in each were confined in small wire boxes stationed in the Detroit river, some at the surface and others anchored at the bottom, to subsist solely on such natural food as might chance to drift into their little prisons. In size these boxes were 14 inches each way. An opening 10¼ inches square was cut from five of the six spaces of the 14 inch cube and these spaces were covered with brass wire cloth, 24 wires to the lineal inch.

Similar lots of fry were placed in small glass aquaria in the hatchery and fed on natural food collected from the river by means of a towing net. The latter was made of India linen in the form of a cone forty inches in length, twelve inches in diameter at the base or mouth and tapering to an opening one and one-third inches in diameter at the apex, which, of course, was closed when in use. The mouth of the net was provided with an iron band or rim to keep it open. For bottom towing the same net was attached to iron runners. When trailed from the stern of a rowboat, this net simply strained out and focused at its small end the minute animal life that was found in greater or less abundance in all parts of the river from the moment the ice went out, or that open water would be reached.

Of the fry thus confined in the river and at the hatchery, reference will be made here to two lots only, as most of the fish not lost through natural causes, or by accident, were preserved from time to time for examination by a scientist, whose report in detail will show with much greater fulness the results and true value of the experiments.

On April 20th, 360 fry were hatched and poured into one of the wire boxes stationed at the surface of the river, about fifteen rods from the south shore of Belle Isle and at a point where the water is ten feet deep and the current very moderate. The box was tossed about with considerable violence by swells and passing steamers, and no doubt many of the fish were injured or killed in this way. By April 30th, or within ten days, 170 dead fish were taken out, also 72 live ones for preservation by the usual methods, leaving 118 on hand. As whitefish fry confined in tanks and cut off absolutely from food in every form will linger along fifteen to twenty-five days before starving to death, it is evident that the heavy mortality of the first ten days was not due to starvation.

By this time most of the survivors had taken food, and by May 6th a few showed a perceptible growth. On May 12th the box was shifted by some person unknown and 26 dead fish were found. Including these, the loss by death and accident from April 29th to May 21st was 70, and six had been preserved, reducing the stock to 42 fish, which were then growing quite fast.

On May 21st the 42 fish were divided into three lots or boxes. One box containing 11 fish was anchored at the bottom; the other two were barely submerged at the surface. The bottom fish did not grow as fast as those at the surface. Our towings showed that the bottom levels were as rich in food life at that time as the top levels, but the screening surface of the bottom box was found more or less choked with mud whenever inspected, and therefore the volume of water that passed through it—and consequently of the food—was materially reduced.

However, not a fish died from May 21st to June 15th, and they had grown to range from one to one and one-half inches in length. Meantime six more had been preserved, leaving 36 on hand June 15th. On this date the usual inspection showed that all of the boxes had been tampered with by some unknown meddler. The covers were not properly fastened down and eleven fish had escaped. There were also seven of them dead, leaving only eighteen. Seven of these escaped July 2d, through a misplaced cover; and from June 15th to July 23d eight died, leaving three on hand, which were transferred to the hatchery. They were then nearly two inches in length.

It is evident that the Detroit river is quite rich in the food required for the earlier stages of whitefish life, for these boxes were placed where the current was feeble, and the volume of water passing through each would naturally be limited to the single screen facing the current, an area ten and one-fourth inches square. Considering the way in which these fish were handicapped and the many mishaps that befell them, their progress and growth cannot be regarded as otherwise than satisfactory and encouraging. So far at least as accessibility to food is concerned, the fry as ordinarily planted in the river undoubtedly fare much better than did those in the experimental boxes.

On April 2d, 400 fry were hatched and placed in two small glass aquaria at the hatchery and then fed exclusively for nearly four months on natural food from the river, daily towings being made for the purpose. During the months of April and May only nine fish died, but 24 lots of 12 fish each were taken out at stated intervals and preserved for examination of stomach contents, leaving about 100 on hand June 1st. These had grown rapidly, much faster in fact than those in the river, and were in fine condition. They continued to do well until about July 20th, when it was noticed that some began to look thin and that the growth of the others, though feeding freely and apparently doing well, was very slow. They seemed to be almost at a standstill. This change may have been due to an insufficient quantity of food or to causes wholly independent of food conditions, but it seems more reasonable to suppose that the river towings were deficient in some element essential to a normal growth at this stage.

Soon afterwards bread was added to the daily diet, and it was taken with considerable freedom, but the fish continued to drop out from time to time—most of the loss occurring in July and August,—until only eight remained on the 21st of the following February, when they were sent to the Paris hatchery. No towings were made after November 23d, and their diet from that time on was exclusively of bread. When moved they were three to four inches in length, in good condition, but small for their age.

The fry of whitefish are so transparent for several weeks after hatching that when confined in glass aquaria in a well lighted room, the presence of absence of food in the stomach may be determined almost at a glance. The presence of their natural food is especially noticeable, as it casts a reddish tinged line throughout the food canal; and the excrement frequently trails or hangs for hours from the anal outlet in the form of an ash colored string, one fourth to two inches in length.

The larger forms taken by the tow net are plainly visible to the unaided eye and may be seen darting about the aquaria with considerable activity, especially when pursued by the young fish. Some of the latter were observed trying to capture the larger forms on the very day that they were hatched, but the earliest instance in which food was positively detected in the stomach was on the third day.

There is a radical difference between the fry and adult stages of whitefish life, both in respect to the character of their food and the manner of taking it. The fry are provided with small, sharp teeth that enable them to seize the little animals upon which they subsist for a time, but the mouth of the adults is of the sucker form, and therefore unsuitable for seizing active prey, but admirably adapted to taking food from the bottom by suction. Such a complete metamorphosis in these respects indicates that still another type of food may be sought or needed during the intermediate stage, or period of transformation. It is not known at just what age young whitefish begin to lose the strictly carnivorous habit and to seek a change in their bill of fare, but these experiments indicate that a partial change at least is desirable or even necessary between the third and fifth months.

PARIS STATION.

J. W. POWERS, OVERSEER.

The Paris station is the station for hatching brook trout, rainbow trout and brown trout. Until the completion of the Soo station and the installation of ponds there for parent brook trout in the summer of 1896, this station was the only trout station of the commission.

The output varies from two and a quarter to two and three-quarters million brook trout fry. In addition about 275,000 rainbow and brown trout are also distributed. For the past three years this has been supplemented by the hatching and distribution of about three million lake trout which have been hatched here because of lack of room and conveniences elsewhere.

Improvements have been made to the betterments of this station in the two years by the addition of one new spawning pond above the highway and the addition of one pond at the lower end of the group of ponds below the railroad. This has added to the capacity of the station to that extent.

The waste.ditch above road has been improved by the removal of the old plank siding which had become badly decayed and replacing it with field boulders similar to those surrounding the new ponds, making a permanent improvement and replacing the unsightly and decaying wood with a neat and attractive embankment. This improvement was carried below the highway bridge and has added much to the appearance and permanent character of the grounds.

The improvement in the construction of the lower new pond necessitated the cutting down of the surrounding grade, required the removal of the surplus earth which was taken to the low ground about the ponds above the road and utilized in that improvement. At that point the ground was low and marshy and covered with flags and at times with stagnant water. This place has been filled in to grade to correspond with the surrounding higher ground, the stream has been straightened, the thicket of small trees has been trimmed out and the unsightly place has been made equally attractive with the other surrounding grounds.

The fence on the south of the ponds above the highway for a distance of about twenty rods has been rebuilt, the tables used for picnickers have been removed and the grounds have since been in much better condition.

A connection has been made by a pipe connecting the windmill with one of the ponds, to furnish water for the windmill tank for fire protection, and for watering the lawns. Pipes for that purpose with taps have been laid to various parts of the grounds and the lawns have been kept in much better condition since these improvements were made.

The woodland lying on the sources of Cheney Creek and the Little Buckhorn, belonging to the State, joins the timber of adjoining private parties and it was thought advisable to define the boundaries to prevent cutting of timber on our premises. Forest fires were each year a menace to the standing timber and it was deemed desirable that this should be prevented as far as possible. We had our lines run out by a surveyor, and a force was put on to clear a strip of land along the line of the timber, rubbish and down timber along the boundaries, one rod in width. This was burned and last summer a board fence was constructed enclosing the property. A new fence has also been built along the frontage of the property on the Muskegon river.

Repairs have been made to the overseer's residence by putting on new double windows, repairing the cellar, and putting new wainscoting in the rooms on the first floor to render the dwelling more comfortable in winter.

The hatchery building has had a new floor put in the part not relaid two years ago. Four ventilators were built on the, hatchery building to secure better ventilation. All the buildings on the property have been repainted, and minor repairs made.

Traps have been put in at the mouths of Cheney Creek and the Big Buckhorn and they have been housed in, for the capture of wild trout from the Muskegon.

The grove between the railway and the river has been fitted up for a picnic ground, with tables; a spring cleaned out for use of visitors and the grounds required for this purpose for the large number of visitors during the summer are now in excellent shape. This change of these grounds from immediately about the ponds has resulted in keeping the grounds free from the papers, broken food, and other accompanying things necessaryily connected with picnic parties which formerly kept the grounds littered with this material during the summer.

In the fall of 1895 and about the spawning time an epidemic disease attacked the parent brook trout, and there was a large mortality. The fish were attacked with a fungus growth and before the season was over we had a loss of between six and seven thousand spawning fish. We could assign no cause for the disease, but steps were taken to inquire into the trouble. The resulting loss has had the effect of somewhat reducing the output of fry from the station for the present year. Preventive measures have been taken to avoid a possible recurrence and we hope to avoid further losses. This disease is common to all pond reared fish.

Following the thefts of spawning fish in 1894, in the following spring we put on a permanent night watchman at this station. He was furnished with a time detector, which requires him to visit eight different stations at stated intervals during the night and we think the chances of further robberies have been thus minimized.

In the summer of 1895 the force at this station constructed a telephone line from the hatchery to the railroad station a mile distant. The poles were cut from the State property, and we now receive telephone notification of all telegrams from the agent and messages are transmitted in the same way, thus saving the time of employés and expenditure for messenger service for delivery of messages.

In July of 1896 serious fires on adjoining property threatened the buildings at the station with destruction. It was only by the most vigorous and untiring work that the threatened loss was averted. The whole of the regular force at the station and a volunteer force of the residents were employed for two days in arresting and extinguishing these fires. The lands immediately adjoining the State property is littered with old down timber, during the dry season of midsummer this is frequently carelessly fired, and until this has been removed from the land, which will only occur from decay, it will be a menace to the buildings on the hatchery grounds that will call for the greatest vigilance.

The grater portion of the timber needed in the improvements at Paris has been cut from trees on the premises by the force during the slack times in the summer. About 35,000 to 40,000 feet have thus been cut from our own lands the last two years.

There are now 23 ponds on the property, carrying about eleven thousand stock fish.

Floats have been made and put in the ponds during the past year to afford shelter and shade for the adult fish during the extreme heat of summer, and we believe with advantage to the fish. The ponds are unshaded by the foliage of trees, and the fish at times seem to suffer from the intense heat of the sun without protection of this nature.

SAULT STE. MARIE STATION.

ARCHIE BABBITT, OVERSEER.

The desirability of this place for a great commercial and game fish station has been emphasized by our experience here since the last report. Nowhere else, to our knowledge, are found conditions which promise and perform so much. At other places one kind of water of a certain temperature must be used for trout work, and another for whitefish and other commercial fish work. The same water will not answer for hatching both fish ordinarily. But here conditions are changed; here both of these fish live in this water as their natural habitat, and both operations can be successfully carried on at the same time. The place is an ideal one. Not only are brook trout and whitefish found native to the Sault river, but they are likewise common to Lake Superior, which, with its great depth and the purity and coldness of its water might be characterized as a mammoth spring.

Since the last report the new station, which had just then been built, has been equipped with the most modern appliances and methods within our knowledge and is today a model as a serviceable and complete hatchery.

The west end of the building has been fitted up with jar galleries and accommodates 200 Chase jars, supply tanks, foot tanks and storage tanks. The east end is fitted with eight banks of troughs containing three troughs in each bank, for the hatching of brook trout. In the arrangement of these troughs the regulation plan in use in the old hatcheries has been departed from to great advantage in the practical conduct of the work. Instead of being fed from a supply trough placed against the wall of the building, against which the ends of the banks or troughs are placed, and being fed from faucets or cocks from the main supply trough, under the new arrangement the hatching troughs stand entirely away from the walls of the building on the open floor space, and are fed by pipes coming from beneath the floor, the upper ends of which are curved or bent downward to near the surface of the water in each trough. This arrangement permits the free movement of the working force around either end of the troughs, and makes the labor much easier. The feed pipes to supply the troughs are out of sight underneath the floor, thus doing away with unsightly feed troughs and giving the freest movement in all directions about the floor space. Underneath the windows on each side of the house are arranged shallow picking troughs where this work is done under a good light.

The motive power for lifting the water is supplied by electricity, a dynamo, small pump and electric current having been furnished by the corporation of Sault Ste. Marie under the arrangement made with them when the location was fixed upon. The working of the dynamo and pump is nearly perfect, such difficulties as have presented themselves being of but small consequence and soon overcome.

Formerly when we occupied the experimental station at this place, a long and expensive drayage was necessary to transport the fish to the railway for distribution. At the time the new hatchery was built we were given to understand a spur would be built from the main line of the D. S. S. & A. Ry. to a point near the hatchery. This has been done since the last report was made, and our car can now be run to within about a thousand feet of the hatchery. The hatchery being on an island, no access can be had to it by teams, and it became necessary to make provision for transportation over this intervening space. We finally decided to construct a narrow guage electric railroad from the hatchery to the spur.

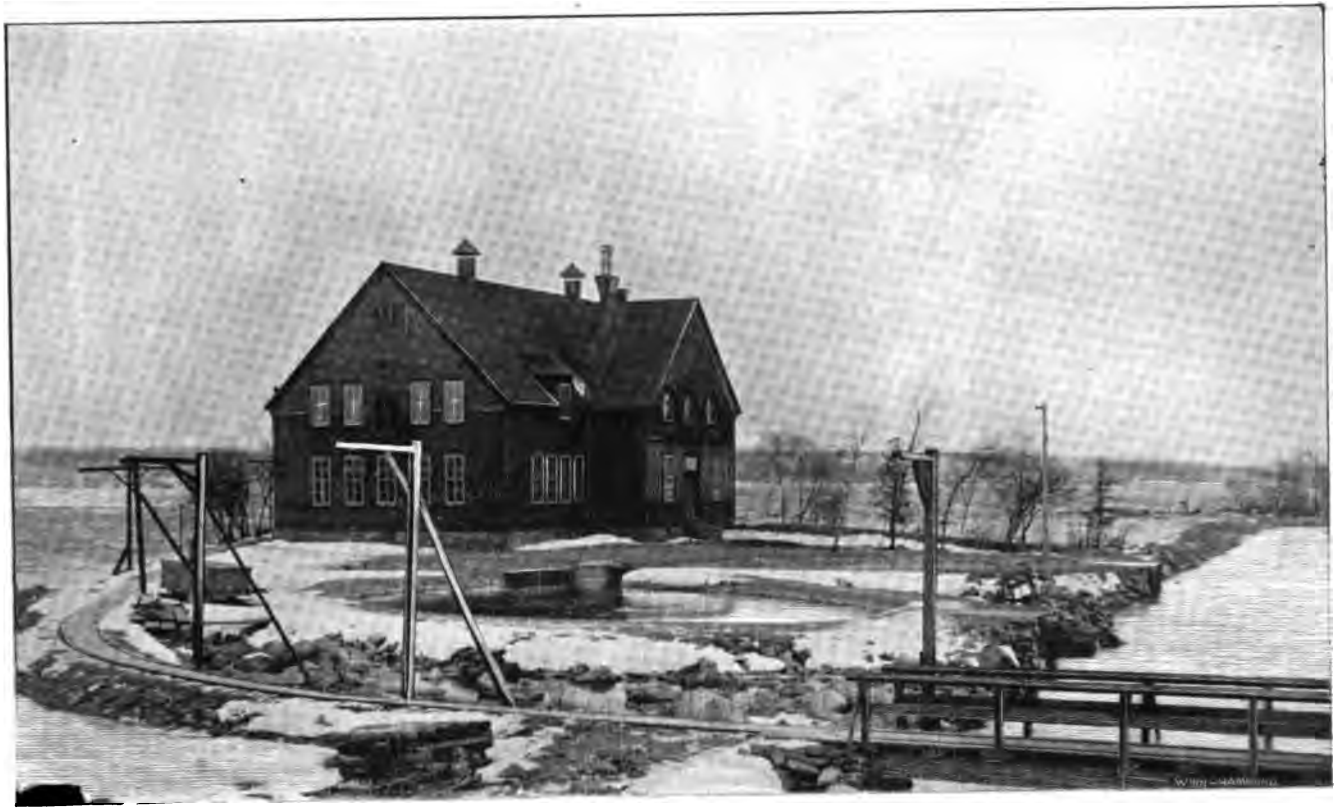
The contractors for the construction of the new lock, after the completion of their work had a large quantity of ties and rails, and through a favorable arrangement we were able to secure at a very reasonable price the necessary material to build the short railway from the door of the hatchery to the railway siding. We were also able to secure in the same manner timber for a bridge across the intervening channel. At a reasonable figure we also had built a trolley car to run over this tramway to transport the cans from the house to the railway spur, and the tramway is now in operation at a very low cost of construction.

During the summer of 1896 we cleared the ground immediately south and west of the hatchery of its boulders, with the aid of the trolley car and blocks and tackle as the motive power, and began the construction of three ponds in which to hold brook trout for stock purposes. Three fine ponds with connecting races and spawning race were completed in time to receive the fish before the spawning season began. The material with which the ponds were constructed is shaly stone mixed with soil, and it became apparent that it was not compact enough to hold a sufficient head of water in the ponds for our purposes. It therefore became necessary in order to put the ponds in proper shape to use water lime to make the retaining embankment. This made the work somewhat more expensive than we had expected, but when finished the ponds proved to be permanent in character and are in excellent condition.

In these three ponds, which are of a clover leaf pattern, there were caught and placed last fall between 900 and 1,000 adult brook trout, from which were taken in the neighborhood of three hundred and seventy thousand ova.

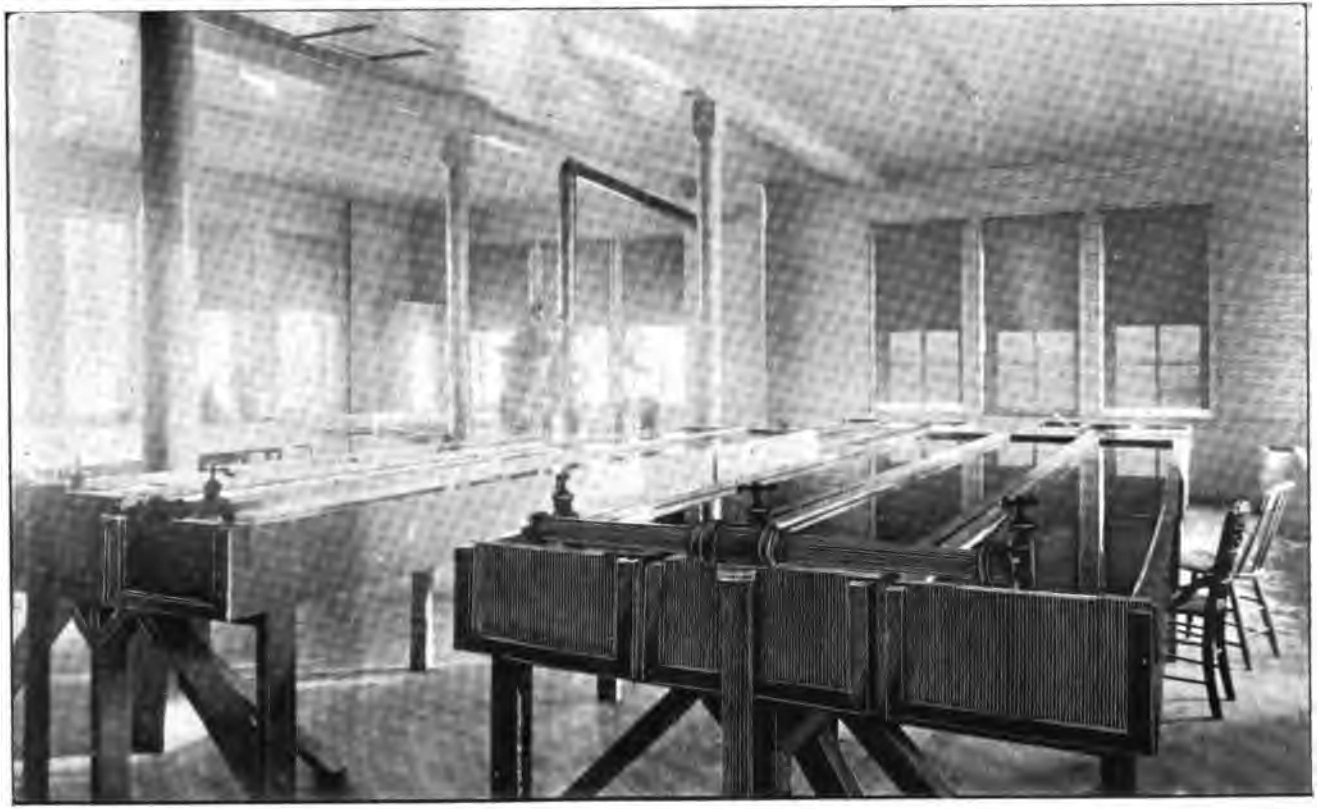
Below the hatchery building we have a large area which can be made into ponds, and should be improved as rapidly as possible in order to bring this station to its full usefulness. To accomplish this, it will be necessary to turn the water that is now flowing over it away from this portion of the territory, and then carry on to this part of the premises a considerable quantity of soil with which to make embankments and ponds. This work, because of matters as they now stand, can be done much more cheaply during the coming summer than thereafter. The government now has on lands closely adjoining the hatchery a quantity of earth, excavated from the new canal lock, which must be removed the coming summer, to permit a grading and sodding of their grounds. We are satisfied arrangements could be made whereby this earth might be secured for our purposes if it is done this summer, and the cost would be comparatively small. Should this opportunity be allowed to pass, after the removal of that earth, the cost of getting the earth there would be greatly increased. It would have to be brought on scows for a long distance and then thrown off and loaded on to barrows and taken about twice the distance. This would greatly increase the cost of construction and would entail two more handlings of the earth, which is the main cost.

Then, too, the property we occupy is in the heart of the Government Canal Reserve. During the coming year the authorities contemplate grading and arranging the grounds immediately adjoining the canal, under a general parking plan for their beautification. When the right was given the board to occupy the place free of cost, as a site for a hatchery, it was understood that the State would put the grounds into such shape as would conform to the government's parking plan, and it would practically become, by reason of its situation, a part of a handsome public park. This work must be done at some time, and can be done better and more economically now than ever again, and we ask that a sufficient amount be allowed to complete the work the coming season. When this station is completed, the ground graded and sodded, and the plant completed, it will be able to care for the waters of the Upper Peninsula and will be one of the stations in which our people will justly take pride.



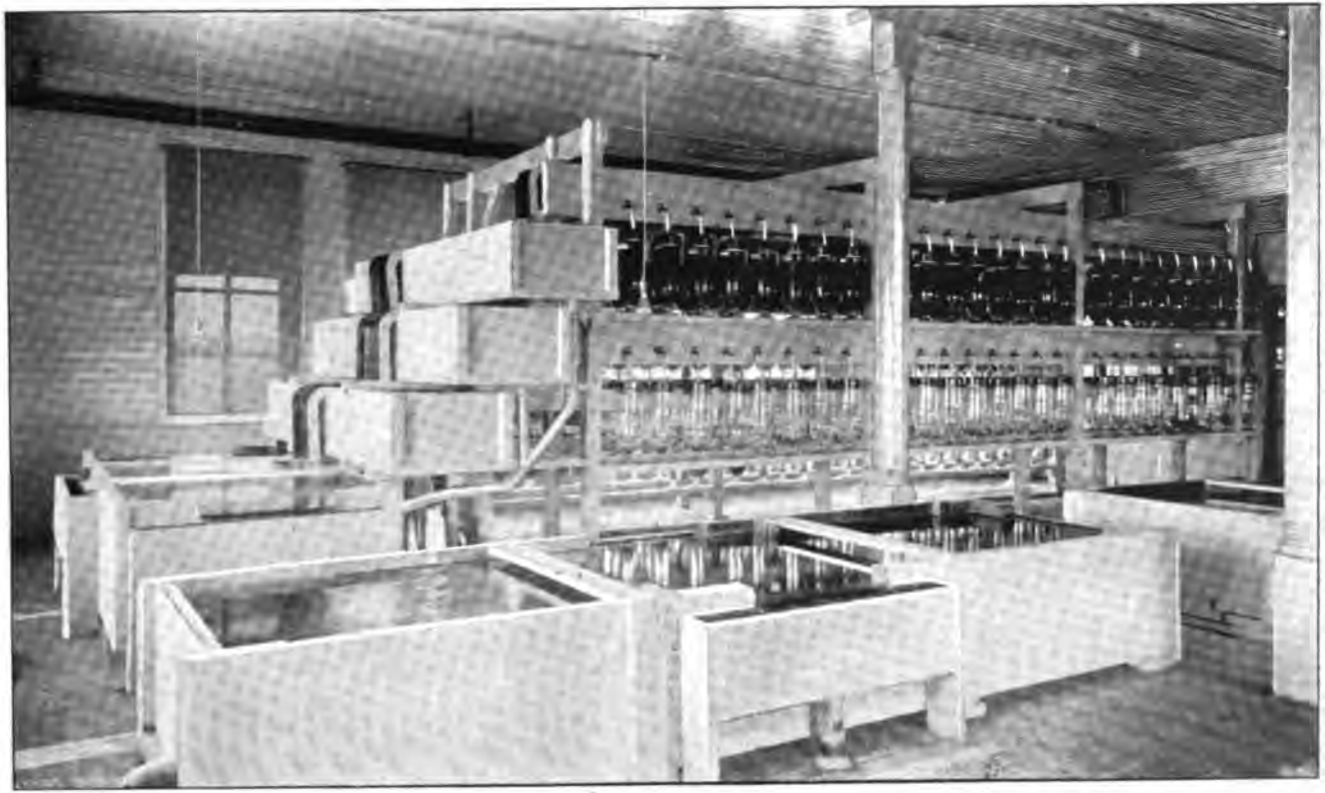
SAULT STE. MARIE HATCHERY.

PONDS AND ELECTRIC RAILWAY.



VIEW OF INTERIOR OF SAULT STE. MARIE HATCHERY.

TROUT TROUGHS.



VIEW OF INTERIOR OF SAULT STE. MARIE HATCHERY.

WHITEFISH JARS AND TANKS.

CASCADE STATION AND BLACK BASS WORK.

CHAS. HOLT, OVERSEER.

In 1893 a station was established on grounds at Cascade in Kent county, for the purpose of conducting experiments in the breeding of small mouthed black bass for distribution in our inland lakes, many of which from years of continued fishing of all kinds had begun to show a decay of the natural stock.

There is hardly a game fish in America so widely distributed as this fish. Its range is from Florida far up into British possessions, and from the Atlantic to the Mississippi, with the exception of a few circumscribed areas. For gaminess it easily takes first place, and in edible qualities is deservedly popular.

The people of Michigan, "The Land of the Lakes," have always had a high appreciation of the bass. The great majority of our beautiful inland lakes have at one time or another abounded with this excellent fish. With acumulation of wealth our people have found more time for leisure and recreation and about the shores of hundreds of these rural gems have sprung up resorts and summer cottages where the people take their summer outings, and angle for the bass. The constant drain upon these lakes has created a demand upon the commission for young bass with which the wasted stocks may be replenished, until now these demands have far outgrown our small ability to satisfy them.

Until 1893 we had never undertaken to propagate bass, nor had the experience of other fish culturists in their artificial propagation been such as to serve as an aid in determining the practicability of such operation. Under these circumstances we did not feel justified in incurring much expense in carrying on our experiments, beyond what was actually necessary to determine what could be done with bass under domestication. When held in confinement certain animals are so influencd by their surroundings that they absolutely refrain from the exercise of the function of reproduction, and this is true of certain fishes.

The salmonoids have always proven most tractable, and the ease with which the artificial fertilization of the ova of this variety of fish as a rule is accomplished is proverbial. On the contrary, many of the spiny rayed spring spawning fishes prove intractable and but shall success results from such operations. So without the knowledge derived from actual experience in breeding bass we were somewhat at sea.

Our earlier attempts to handle these fish and artificially impregnate the ova led to the belief that it might be successful. Our added experience, however, has convinced us that, considering the natural peculiarities of the bass, and the good results obtained, a much larger success, at less expense will result by carrying on the hatching by the pond-culture system.

With a small number of fish carried in two small ponds for three years we have achieved excellent results. These operations have been carried on under the disadvantages of a poor water supply, and we have been handicapped in other ways, but we have in the past two years distributed from two ponds containing about 100 adult fish 194,800 bass. This has been supplemented by 135,000 taken from the natural beds in the Thornapple, and by 164,000 large mouthed bass taken from a small neighboring lake.

The fact that we were distributing black bass has become known and the requests from all quarters for young fish have absolutely overwhelmed our feeble capacity to respond to these calls. Believing that this growing demand should be satisfied, and knowing that no branch of our work would be more fully appreciated, the board has carefully investigated in the last year about half a dozen possible locations for the establishment of a bass station. Most of these places had suitable water, but the things most desirable, good water and convenient railroad facilities for shipment, without large expense for transportation from ponds to car were found at none of the places except on Plumbs Creek in Kent county. Here is an ample volume of water, the land necessary for the station is fairly reasonable in price, and excellent facilities for cheap shipment is assured. Five acres of land have been secured here upon which can be constructedthe necessary ponds, and within a year we should be able to distribute five hundred thousand bass from the new station to the inland lakes, and in another year we should be able to double that amount, and gradually increase the quantity far beyond that capacity.

It will be necessary at this session of the legislature to provide a sufficient money to dam the stream above the proposed site to give head for a supply for the ponds, to lay the pump logs for carrying the necessary water, construct the ponds and required races, and build a small dwelling for the resident overseer, a tool house, and to provide for the necessary grading and fencing of the grounds.

GLENWOOD.

WORDEN WELLS, OVERSEER.

This station has been run on the same basis for a number of years, and is the station from which carp and gold fish are sent out.

The carp has proven a valuable fish for the people who buy the cheaper varieties. The carp is a rapid grower and attains to a large size. It is suited to many of our large ponds and lakes in which other fish are not found, and large quantities of carp are sold in the State each year.

The fish is well suited to pond culture, and when cared for and fed well repays for its culture. In New Jersey and in some of the other eastern states, the raising of carp for market is carried on quite extensively by private parties with profit. The cary does not rank with our finer varieties of fish, but is quite superior to any of the sucker family or the grass pike, thousands of pounds of which are marketed every year.

The board have in the last year discontinued the rearing of gold fish at this station, as being outside our province, it being a purely ornamental fish. Beyond a few that are given to municipalities for ponds in parks, nothing is now done with this fish by the board.

CHARLEVOIX STATION.

J. P. MARKS, OVERSEER.

This station is still run as a relief station for the hatching of eyed whitefish ova, and it is only run for about two and a half or three months of the year. When the ova has sufficiently developed in the Detroit hatchery, the quantity designed for distribution in Lake Michigan and in the Straits of Mackinaw are sent to Charlevoix, where the hatching is completed. In actual operation this station has been of great service. It serves as a relief to the Detroit station which before the establishment of this station was often filled during the latter part of the hatching season with young fish to such an extent that it was beyond the capacity of two cars kept in constant employment to free the house of fish and keep them in good condition.

The building occupied at this place is rented, and was put in condition for the service required of it at a small cost. It is in charge of one of the regular employés of the board during the time it is in commission, and is run at a low cost of management. No improvements have been made here during the last biennial period, beyond the small repairs necessary to keep it in condition.

Eventually it would be well for the State to build at this point a permanent hatching station for the hatching of lake trout. Charlevoix is the most important point for the taking of lake trout in the State, and if this fish is to be maintained early attention will have to be given to its propagation and distribution. Such a station may be built here at a very moderate sum, if the municipality of Charlevoix will consent to grant to the commission a free site and a perpetual water supply.

THE CAR.

H. H. MARKS, CAPTAIN.

The car "Attikumaig" has continued to give most effective service in the distribution of fish. It is constantly in commission from about the first of February to the end of July in each year, and makes an annual mileage of between twenty and thirty thousand miles. This includes the distribution of trout of different kinds, whitefish, wall-eyed pike, carp and black bass.

The establishment of the station at Charlevoix has relieved the car of a large amount of work, and were it not for this the service of another car would be required.

It has been necessary to make far more extensive repairs to the car than were contemplated two years ago, and the estimate for this purpose was considerably below what has been actually spent. With the heavy loads carried and with the constant use to which it is subjected, it is only a question of a short time before a new car will have to be purchased.

A year ago last fall it was run to the shops and given a thorough overhauling and repaired at a cost of about $1,400. On the first trip made with it afterwards, when carrying 21,000,000 whitefish ova to Charlevoix, during one of the severest nights of the winter, she was thrown from the track by the misplacing of a switch at Traverse City and badly wrecked. All her cargo was lost on account of the severity of the weather, and the crew were badly shaken up, but not seriously injured.

The C. & W. M. Ry., who, through an employé's fault, were responsible for the disaster, immediately ran the car to their shops and put her in as good condition as possible. It appeared to be as good as ever, but later on it became evident that it had been weakened. It has since been necessary to make other repairs to keep it in condition.

When we consider the large mileage the car runs in a year, and the length of time it has been in service, we must admit it is now in better condition than might be expected. With the many thousand miles it has run this is the only mishap it has had of a serious nature.

It seems quite desirable, in order to carry fish with minimum chances of loss, particularly adult fish, during the summer months, from field stations where men are engaged in capture of wild trout for new stock at the different stations, that a plant should be placed in the car by which air can be forced into the receptacles in which fish are carried. The present method mainly used by us to secure safety in carriage of fish is refrigeration, that is, the temperature is lowered by the introduction of ice into the water, as well as about the cans. This renders the fish measurably dormant and their consumption of oxygen is smaller for this reason. But there is more or less danger in this method, the water sometimes becoming robbed of the necessary amount of oxygen to sustain the fish. There is an additional danger if the utmost care is not used, in changing them to water of a greatly different temperature at the end of the journey.

By the installation of a proper plant permanently in the car, fresh air can be forced into the water in which the fish are carried and the danger minimized to the lowest point. We have made some investigations as to the cost of such a plant, and find that it can be put in at a cost of probably about five hundred dollars. We would ask that a sufficient amount be allowed for this purpose. Once in working order, it will greatly improve our present method, especially in the handling of adult fish in hot weather.

COURTESIES AND EXCHANGES.

We desire to acknowledge the receipt of 35,000 black spotted trout donated by the U. S. Fish Commission from the Leadville hatchery. This fish is a native of Colorado streams and is esteemed as a good game fish. It is said to grow more rapidly and to a larger size than the brook trout or rainbow. When hatched and ready for distribution, these fish were placed in the Pere Marquette and Little Manistee rivers. The plants were made in fewer streams than they otherwise would have been, in order to get earlier results, and that we might thus learn as soon as possible how this new fish would thrive in our waters. Should he do well, these plants can be hereafter supplemented with others and be given a more widespread distribution.

We also received from the same source 481 gold fish and 150 adult brown trout, which were planted in wild streams and donated to applicants.

The New York Fish Commission in January, 1895, donated 50 adult female rainbow trout, 100 yearling rainbow trout and 100 yearling brown trout.

The thanks of the board are due to the Canadian authorities for granting permits to this board to take ova of the brook trout and salmon trout in their waters, under the condition, voluntarily given, that we would return a good plant of young fish when hatched to the water from which they were taken.

An exchange of 100,000 eyed ova of brook trout from the Sault station was made with the Castalia, Ohio, Fishing Club, for an equal quantity of trout ova from that station.

We desire to acknowledge the courtesy extended by Mr. Wheeler, superintendent in charge of the Sault canal and improvements, and to Hon. Andrew Jackson, for donations of gravid female brook trout during the fall of 1896, from the fountain at the locks and from private aquaria, which were a material addition to our small stock of spawning fish at that station.

STATISTICAL AGENT'S REPORT.

Detroit, December 31, 1896.

To the State Board of Fish Commissioners—Having completed the canvass of the commercial fisheries of the State and the compilation of the statistics under your direction, I herewith submit a narrative statement of their condition for the years 1894 and 1895.

For convenience in making comparisons, conducting and tabulating the work, the lake coast of the State was divided into five districts in 1892, which are as follows:

1st district includes the Detroit river from Detroit to Lake Erie, and all of Lake Erie lying within the State.

2d district, the east shore of Lake Michigan lying within the State, the Fox and Manitou Islands, the Straits of Mackinaw and the north portion of Lake Huron as far south as Rogers City.

3d district, the north shore of Lake Michigan lying within the State, including Green Bay, the Beaver Island group and the north shore of Lake Huron to Detour.

4th district, the west shore of Lake Huron from Rogers City to Port Huron, including the St. Clair river, Lake St. Clair and Detroit river to Detroit.

5th district, all of Lake Superior lying within the State, Isle Royal and Sault Ste. Marie to Detour.

DISTRICT NO. 1.

The waters of this district being shoal, the fishing is carried on almost entirely with pound and fyke nets, a few gill nets being fished from Monroe. The catch consists largely of rough fish, perch, suckers, carp, etc., although of the better kinds of fish a good many wall-eyed pike are taken, also a few sturgeon and whitefish, the annual catch varying with the seasons, as shown in the following table:

In this district, I have to note an annual increase of the German carp, which are prolific and of rapid growth. The grounds about Monroe being so well adapted to them, it is the opinion of the fishermen in that locality that other kinds will gradually disappear and that they will compose the principal part of their catch in the near future. The commercial value of the carp is from one-half cent to three cents per pound in the round; governed by market conditions, as are all other kinds of fish. Some of these fish attain a weight of twenty-five pounds each. One of the most profitable fish caught in this district, the sturgeon, are falling off each year, with little hope of restoration.

Whitefish were at one time very abundant in this district, but have been fished out until the catches had become very small compared with former years, but since the planting of whitefish fry began they have been partially restored. The catch of whitefish in this district in 1895 was 45 per cent better than that of 1893. There appears to be no feeding grounds for the young whitefish in the west end of Lake Erie, at least I find very few are caught in the pound nets fished there during the summer.

The catch of pike, perch or wall-eyed pike in this district for the year 1895 was nearly double that of any of the four preceding years, thus showing that they withstand the continued fishing of these waters better than any of the more valuable kinds of fish. The total product of the fisheries of this district for the year 1895 was something over 1,500,000 pounds. Of this catch, 104,000 pounds were whitefish, reported as being adult fish; 429,000 pounds of wall-eyed pike, 226,000 pounds of German carp, the balance being made up of other kinds, largely suckers and perch.

DISTRICT NO. 2.

This district embraces an extensive lake coast and presents some features of the industry not found in the first district, most prominent of which is a kind of fish termed by the fishermen of that locality long jaws. While they are essentially a deep water fish their general appearance, the decided protrusion of the under jaw and their size indicate that without doubt they belong to the herring family. They are chiefly caught in forty to seventy fathoms of water with large gangs of gill nets fished with steam tugs, from St. Joseph and Grand Haven, two of the largest fishing stations in this district. When put upon the fresh fish markets for sale, they are dressed the same as the whitefish and trout and their price to the fishermen for the past two years has been from two to two and one-half cents per pound. To a considerable portion of this catch, however, these prices do not apply, as many tons of them are sold at a less price to smokers, being too small to ship fresh.

And here I have to note the yearly decrease in the catch in number of fish at these places since 1893—as well as the rapid decrease in pounds. In 1891 the gill nets in general use by the fishermen of this district for the catch of long jaws were of three-inch mesh and they were continued in use, with perhaps a few exceptions, till 1893, when a reduction of the meshes began, and in 1895 a 2½-inch mesh net was in general use. The size of the mesh tells what the size and character of the fish is, and the following figures for each of the years referred to will show the devastation such destructive methods have brought to the fisheries of this district.

For the year 1893 the catch of this kind was 4,297,725 pounds; 1894, 2,455,850 pounds; 1895, 1,649,933 pounds. Showing the annual decrease to be nearly one and a half million pounds. They are a cheap fish, and are of much less importance than the whitefish and trout which compose the largest portion of the catch in this district, and by far the most valuable part.

During the same period the whitefish and trout suffered a marked decline, but it has not been quite as rapid; the causes, however, have been the same, namely, the fishing of small mesh twine in both the gill and pound nets which are extensively used in this district. Large outfits of gill nets are fished from St. Joseph, Grand Haven, Manistee, Frankfort, Charlevoix and other smaller stations along the shore, and pound nets along the shores in waters adapted to them. The constant fishing for lake trout at all seasons of the year, which is true of the south end of this district, when the winters are mild and the harbors are open, together with the taking of young trout with small mesh gill nets used in fishing for long jaws and blackfins, no doubt has had much to do in depleting these waters of the lake trout.

In 1893 the catch of lake trout of this district was 2,498,400 pounds; in 1894, 2,045,900 pounds; in 1895, 1,734,350 pounds; showing an annual decrease of nearly one-half million pounds.

In speaking of the whitefish catch of this district and referring to the causes that have led up to its decline, the reasons herein given have been gleaned from personal investigations, and apply with equal force to the whitefish grounds all over the great lakes. In considering the different varieties of fish of these vast bodies of fresh water, in commercial importance the whitefish takes precedence over them all, therefore their destruction is of much greater significance. At one time they were most plentiful in all these great lakes, so peculiarly adapted to them, and continued so until the introduction of the pound net. Some years ago this device came into general use by the fishermen, not only of this district, but throughout the entire chain of lakes, and very soon after its advent came the rapid destruction of the whitefish. So well adapted are these nets to their capture, from the fact that the fish go in schools and are good leaders, they are easily taken. The mesh of the pots in pound nets now in general use are so small that when the fish are once in the pound their escape is impossible. From personal observation and the statements of fishermen themselves tons of little whitefish have been thrown upon the shores, too small for any use except for fertilizing purposes. The inevitable conclusion is that this mode of fishing is one of the most potent causes of their gradual extermination from these waters. The good results obtained from their planting, which the fishermen themselves endorse in strong terms, are to a very great degree neutralized by the wasteful methods of fishing practiced.

In this district the catch of whitefish for the year 1893 was 1,158,500 pounds; 1894, 953,705 pounds; in 1895, 603,490 pounds; showing a large annual decrease, and for the years 1894 and 1895, one-half million pounds of these were immature fish, chiefly No. 3's and under.

The sturgeon, now a most valuable fish, and very abundant at one time in this district• have also suffered a great decline, and being of slow growth the capture of the immature fish (which might easily be returned to the waters alive when taken and in all cases should be) means an earlier destruction of the sturgeon than perhaps any other valuable fish in this district.

DISTRICT NO. 3.

This district embraces the north shore of Lake Michigan and the Beaver Island group, and the extent of its lake coast is about only one-half that of the second district. The general features of the industry, however, and the appliances used in fishing are the same, and the value of its products are nearly equal to that of the second district. The largest catch of any one kind of fish in this district are the shoal herring that are taken in Green Bay from Menominee north on the shore a distance of fifty miles, where fifty-two pounds nets are fished with an annual production of over two million pounds, and at Gros Cap, between Pt. Aux Chenes and Pt. St. Ignace. The shoal herring leads in the catch of the third district, and the deep water herring in that of the second district.

In Green Bay there has been a slight increase in pounds of the herring catch for the past three years, but there has also been a marked decrease in their size, owing to the small mesh used in the pounds of the nets fished upon those grounds.

The Menominee, a mongrel whitefish, ranking in value somewhat better than the herring, are caught in Green Bay and down the shore of this district with gill nets in considerable quantities, and are becoming quite a factor in the gill net catch. They are used exclusively for salting, being a soft fish, are of larger size than the herring, and more valuable. The reduction of the mesh from 3¼ to 2½ inches is having a serious effect upon them also.

Wall-eyed pike, which are always found in greater abundance in large rivers, or in bays where such rivers have their outlets, are chiefly caught in this district in Big and Little Bay De Noquette, and constitute by far the largest and most profitable portion of the catch in that locality, and the quality of the fish caught here is excelled nowhere upon the entire chain of lakes.

The sturgeon catch of this district is about the same as that of the second, and the persistency of the fishermen in taking the small sturgeon is showing its effect.

Last, but not least, attention is called to the whitefish and trout catch of this district. While the catch of these varieties is considerably less in pounds, their commercial value is equal to the combined catch of all the other kinds put together. The decrease in the catch of lake trout here is marked, but it has not been as great as in the second district. In 1894 the catch was 993,945 pounds, and in 1895 was 768,150 pounds, which shows a falling off of one-quarter million pounds. From information gathered from the fishermen, whose experience goes back a quarter of a century or more, the whitefish grounds of Green Bay and the entire shore of Lake Michigan lying within this district, together with the shoals and reefs included therein, are the best adapted to this fish, and have been the most productive of this most valuable kind of fish of any waters lying within the State. Owing to the methods of fishing with pound nets, which are the same as those referred to in the second district, and to the vast amount of sawdust and mill offal carried out of the Manistique river, covers the bottom of the lake for miles in every direction, there has been an annual decrease since 1893 of over 340,000 pounds.

In 1893 the whitefish catch of this district was 1,296,450 pounds; in 1894, 742,800 pounds; in 1895, 616,160 pounds—550,000 pounds of the last two years' catch, which is nearly one-half, consisted of 2's and 3's, many of them being of the herring grade. Just so long as this method of taking the young whitefish is permitted, just so long will the whitefish surely and gradually disappear and the work of planting be robbed of its results.

DISTRICT NO. 4.

The extent of coast embraced in this district is about the same as that of the second, but some of the features presented differ from those of any of the other districts. The appliances used in taking fish are the same, except that in the waters of Saginaw bay and Saginaw river, which are shoal, a vast number of fyke nets are fished. They are used and operated, however, upon the same principle as the pound nets, having leads and hearts and a bag or pound. From Rogers City to, and including Au Sable, pound nets are fished at some of the stations, but by far the larger portion of the catch is made with gill nets and consists chiefly of whitefish and trout, fully three-fourths of the catch being lake trout.

The fisheries of Saginaw bay and Saginaw river, inside of a line drawn from Au Sable Point to Pt. Aux Barques, in 1894, produced in the aggregate 9,834,271 pounds of fish, and the outfits used in their capture were nearly all pound and fyke nets, the total number used being about five hundred. Of this catch, about two million pounds were whitefish, trout and wall-eyed pike; the balance were chiefly rough fish of small market value. The local laws now in effect prohibiting the catch of small fish of the various kinds in this locality, with a good enforcement of the same, would be of great benefit to the wall-eyed pike, but none whatever to the young whitefish, as it does not apply to the fishing grounds where they are taken.

From Port Austin to Port Huron, pound nets, gill nets and seines are used by the fishermen, the catch consisting of whitefish, lake trout, sturgeon and herring. Near the outlet of Lake Huron at Fort Gratiot, more sturgeon are caught than at any other place in the State, and their yearly decrease in this district is quite as pronounced as that of any of the others. The fishing from Port Huron to Detroit, which completes the review of the fisheries of this district, is carried on with hook and line and seines in the St. Clair river, and pound nets and seines in Lake St. Clair and Detroit river, the product of the catch being wall-eyed pike, whitefish, and a considerable portion of rough fish. The baneful effects of pound net fishing in this district upon the whitefish is shown, 40 per cent of the catch being 2's and 3's and under.

DISTRICT NO. 5.

This district embraces the entire coast of Lake Superior lying within the borders of the State, Isle Royal and the Sault river, to Detour, at the head of Lake Huron. It is the largest of any of the subdivisions, and the catch of whitefish and trout is largely in excess of that of any of the other districts. The manner of fishing these waters and the appliances used in the capture of fish are the same as elsewhere adopted by the fishermen; the catch consisting of whitefish, trout, pike perch, herring and sturgeon, and in the order above named as to quantity and marketable value.

The trout catch of Lake Superior consists chiefly of the siskowet variety, which is not as well adapted to the fresh fish markets as the Mackinaw or shoal water trout, being too fat; but when salted, it finds a ready market.

Throughout this district pound nets, gill nets and seines are fished upon the grounds best adapted to each of these devices, and the kinds of fish taken have already been enumerated. Pound nets are fished from the following stations in this district, viz.: Union Bay, Ontonagon, at the outlets of the Flint Steel, Fire Steel and Sleeping rivers, Eagle Harbor, Copper Harbor, Bete Grise bay, Traverse bay, Portage entry, Fewsville, Catholic Mission, Baraga, L'Anse, Huron bay, Big bay, Marquette, Au Train, Old Munising, Grand Marais, Whitefish Point, Whitefish bay, the Sault river and Detour. At many of the above stations gill nets are also fished, but principally from Isle Royal, Ontonagon, Portage Entry, Marquette, Grand Marais, Whitefish point and Detour.

Each year since 1891 there has been a marked decrease in the catch of whitefish and trout in this district, but the depletion of whitefish has been much greater than that of the trout, as shown by the following data. In 1891 the catch of trout was 3,772,500 pounds; that of 1895 was 2,555,615 pounds, which made the falling off of trout during that period 1,216,885 pounds. The whitefish catch of 1891 was 4,819,900 pounds, and in 1895, 1,717,220 pounds, showing the decrease of the whitefish during that same period to have been 3,102,680 pounds, or nearly three times greater than that of the trout.

Of the 1,717,220 pounds of whitefish caught in this district in the year 1895, 470,000 pounds were immature fish and every ground in this district fished with pounds nets furnished a portion of this amount of small whitefish in greater or less quantities, but more notably so at Marquette and Detour, where liberal plants of whitefish have been made during the past five years. In this district, as well as in the others, the use of the pound net is the chief device, in the destruction of the young whitefish. The herring caught in this district are principally taken at the Calumet water works, Portage Entry and Marquette. They are of little importance, however, as the total catch for the year 1895 was only 207,000 pounds.

At all of the above stations small whitefish are taken and the fishermen in reporting their annual catches, put them in under the guise of herring. This is especially true of the reports taken at Marquette and is amply verified by some of the fishermen at that station.

The catch of immature fish and the wasteful manner of fishing practiced by the fishermen throughout Michigan's entire lake coast, especially where pound nets are fished, is a matter of great concern, and is doing more than any other one thing to entirely deplete the great lakes of whitefish, and must ultimately ruin the fisheries of our State. For example: At Mackinaw City in July, 1895, sixteen packages (or half barrels) of salt whitefish caught with pound nets a few miles below, were brought there and sold. Opening a package for inspection, we took out eight fish and put them on the scales, and the eight fish weighed only one pound. This showed that the package contained 800 fish that netted the fishermen only seventy-five (75) cents! Could these fish have remained in the lake two years, they would have attained a weight of at least one and a half pounds each, and the 800 fish would have weighed 1,200 pounds. At four cents per pound they would have brought the fishermen $48.00 as against 75 cents.

In July, 1896, at this same fish house at Mackinaw City, the entire catch of a pound net fisherman a few miles above, for the months of June and July of that year, was brought by this firm and an examination of their books disclosed the following fact: Total catch eighty-nine (89) packages of salt fish. On inspection they were graded as follows: 60 packages No. 3 white; 19 of No. 2 white; 3 of No. 1 white, 4 of herring, 2 of suckers and 1 of trout.

The commercial fisheries of the State, extending over a lake coast of two thousand miles, employ about five thousand men, with an annual production of 37,000,000 pounds of fish food, that brings to the fishermen each year over $1,000,000, makes it a most valuable industry; an industry that should be fostered by the State, both by the liberal appropriation of funds for the artificial propagation of fish with which to stock the waters of the great lakes, and by the passage of good and wholesome laws, with a thorough and efficient enforcement of the same for the protection of the young whitefish, also the adult fish during their spawning season.

Respectfully,
C. H. Moore,
Statistical Agent.

In connection with the foregoing report the following diagrams are published to emphasize the fact:

Diagram showing decrease in pounds of whitefish caught in Michigan waters in 1885, 1891, 1892, 1893, 1894 and 1895.

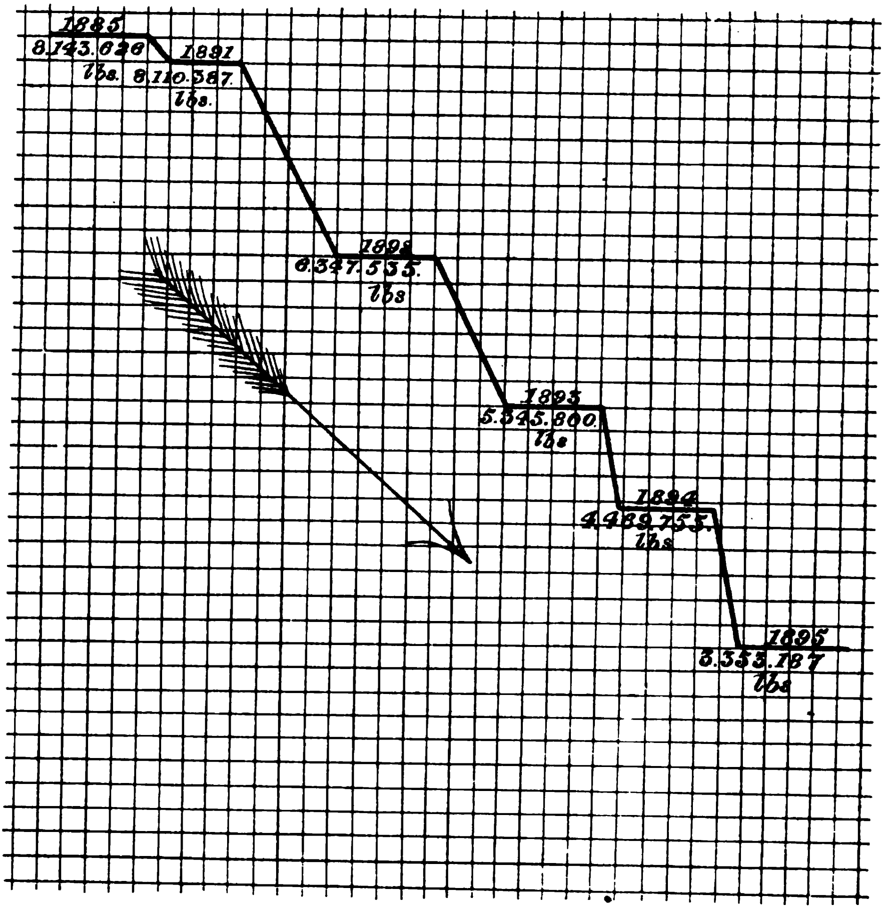


Diagram showing decrease in pounds of lake trout caught in Michigan waters in 1891, 1892, 1893, 1894, 1895.

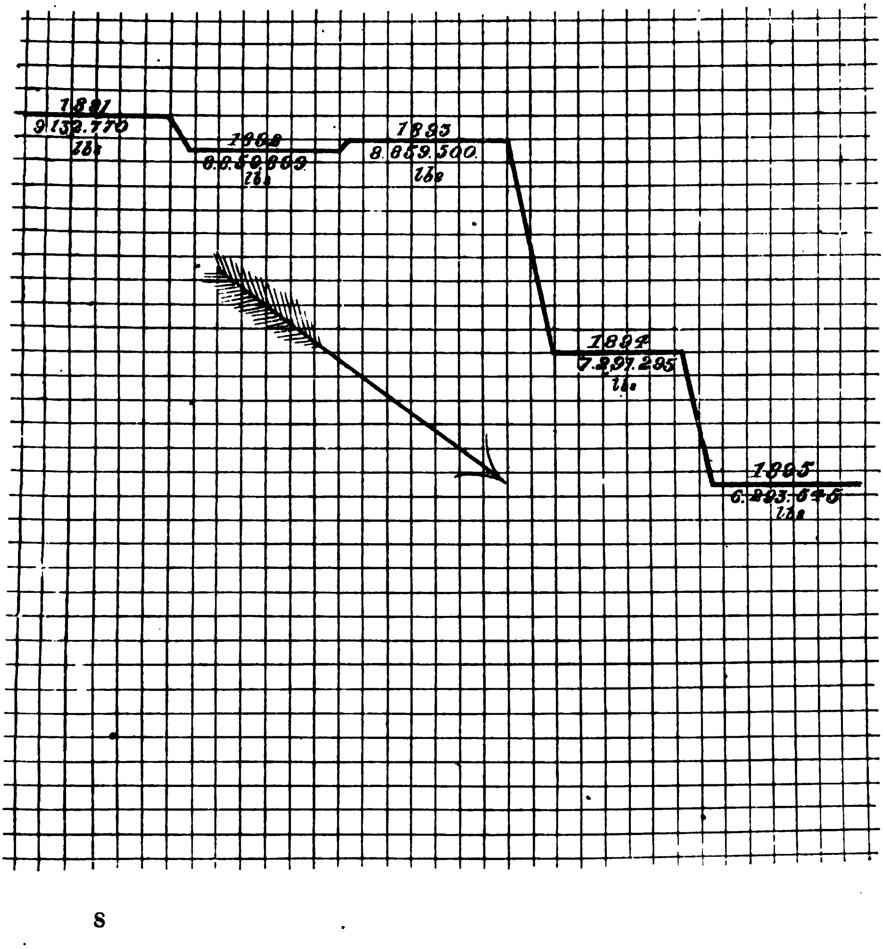
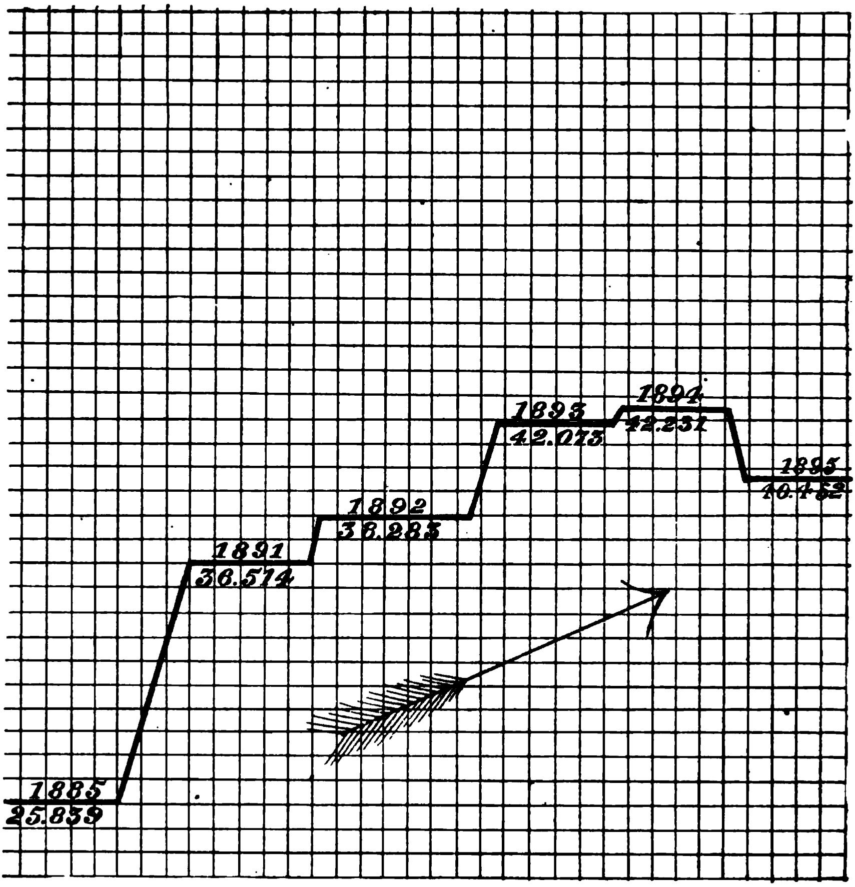


Diagram showing increase in number of nets used in Michigan waters in 1885, 1891, 1892, 1893, 1894 and 1895.



LETTERS OF COMMERCIAL FISHERMEN.

ON THE DECAY OF THE FISHERIES AND CAUSES, AND THE SUCCESS OF ARTIFICIAL PROPAGATION OF FISH.

ESCANABA, MICH., *Dec. 5, 1896.*

Your letter at hand and noted. In reply will say that we noticed more small whitefish were caught here last summer and the summer before than in the seasons previous thereto, and furthermore, that those small whitefish indicate by appearances that they are planted fish.

Respectfully yours,
HANSON & JENSON.

MARQUETTE, MICH., *Dec. 10, 1896.*

Kindly note enclosed item, taken from Daily Mining Journal published in town here. Item is self explanatory. I am sure you can agree with me that this would be very injurious to fishing here, especially for whitefish, if it is carried through. These people have been catching young whitefish for herring pretty nearly all season until law was enforced recently. Kindly do what you can to stop this, as it is no use planting whitefish here and having them caught and sold for herring. Kindly send me a copy of fish and game laws for reference.

Yours truly,
JOHN PARKER.

BAY CITY, MICH., *Dec. 4, 1896.*

Your letter received. Have been very busy and no time to answer the question asked.

Now all I can say is this, that while the planting of whitefish in my opinion would be very beneficial, it has not been allowed to show itself, as unscrupulous and ignorant parties have caught and salted too many small ones. That a great many small fish have been taken is very evident to yourself and the greatest wonder is that even a small percentage of these fish that visit the feeding grounds ever attain the size they do.

I should say keep on planting fish, but for heaven's sake do stop the catch of small ones by strict laws duly enforced.

Yours truly,
D. A. TROMPOUR.

AU SABLE, MICH., *Dec. 4, 1896.*

Mr. C. H. Moore:

DEAR SIR—Yours to hand several days ago and in reply must say that Mr. Whitaker's letter or communication in the press of this date voices my sentiments in regard to Mr. S. H. Davis, and in fact nearly all the large fish dealers are in the same boat—all self.

Now, Mr. Moore, there is one thing I would like to impress on your mind and that is, whatever laws you people make or cause to be made, you want to regulate the size of mesh in trap nets and gill nets, but don't be led away with the idea that the size of the fish, say one and one-half pounds, would stop the catching of small fish not in the least, for, as a matter of fact, if the mesh was ten inches, we would often catch small fish. Then what would you do with the small fish? Would you throw them away, or what would you do with them?

You can rest assured that I am at your service at any time and all times to give you all the information I can, but don't make laws that a man will have to break or else go out of business. Make the mesh whatever size you like, but have the good sense to leave the weight alone, because we can and do, and can't help but catch some small whitefish and trout in our gill nets, and Davis, Alpern, and all the rest know it full as well as I do, but the amount is small. But look to the trap nets. That is where your small whitefish are murdered.

Yours respectfully,

D. LINCOLN.

THOMPSON, MICH., *Dec. 11, 1896.*

As I understand, there is a scheme to do away with the State hatcheries. Now, I think that would be the worst thing that could be done to the fishing business, for I am a fisherman and have been at the business for twenty years, and know that before there were any fish planted on the grounds at Bark Point and vicinity, there were hardly any fish to be got: could not make it pay to fish for them, but since fish have been planted we are having a good increase every year. This year our catch was nearly double what it was last season.

Now, I will close by saying I hope that the State will continue to hatch and plant fish until it will be up to what it used to be in the fishing business.

Yours truly,

SIMON J. BOUSCHOR.

EPOUFETTE, MACKINAC COUNTY, MICH., *Dec. 6, 1896.*

Yours of the 21st is at hand and contents noted. Would say in regard to the planting of whitefish in the waters of Lake Michigan and the Straits of Mackinac that in my opinion it is a success so far as the young fry living is concerned. The greatest and only trouble in my opinion is in allowing the fishermen to take them out before they mature by using small mesh nets, that is in the pound or trap nets. I do not think that gill nets have much to do with the destruction of whitefish, that is the nets they use for menoninees, say 2¾ to 3-inch mesh. I have examined them closely and have not found one whitefish in a boat containing from five to eight packages.

Now in regard to pound nets. Those little fish will strike the leader and go swimming backwards and forwards through the twine until they finally bring up into the pot, where they are at a standstill, as the mesh is too small for them to get free, and they have to be taken out by the fishermen, and those that are herring size are salted and those that are too small are dumped in the offal heap.

Now I have been a pound net fisherman for 36 years and I conceived this idea 20 years ago, that if we caught off the small fish before they came to maturity, we soon ruin the lakes of the finest fish that inhabits fresh waters, and for that reason I would not use less than 4-inch mesh for my pots. I owned a good scope of ground and was not troubled with other fishermen. There was not a season but my ground paid something, some seasons more than others, until about five years ago, when they saw I was getting fish and was over one mile from shore so they had as good a right as I had to the ground, and then they planted nets on both sides of me, and for the first two years they caught about as many No. 1's as I did and put up hundreds of No. 2's and 3's in packages. The fourth year they caught nothing, neither did I.

Now, I will give you my opinion about the planting of whitefish. If they were allowed to mature, I believe they would average 75 per cent. If no fisherman could fish a smaller mesh than 4 inches, with the help of the State in five years, fish would be as plenty as they were thirty years ago.

Yours respectfully,
J. R. McLEOD.

DETOUR, MICH., *Dec. 29, 1896.*

C. H. Moore, Esq.:

DEAR SIR—You ask my honest opinion as to what I think about the planting of whitefish fry. I have always been a strong believer in it, and from my actual experience as a fisherman for over thirty years at this point, there is no question in my mind, and in fact I almost know it to be a fact, that if we had no hatchery to furnish and plant the whitefish fry, the whitefish would have been almost extinct today. As it is, about 90 per cent of all fish caught now are what we call "hatchery" fish.

I am yours respectfully,
SAMUEL BUTTERFIELD.

ST. JOSEPH, MICH., *Dec. 21, 1896.*

C. H. Moore, Detroit, Mich.:

DEAR SIR—On returning home from a leave of absence, I found your letter in regard to planting whitefish fry awaiting me and hasten to answer.

My opinion is that we are getting good results now from the planting of whitefish fry, as you will see on your next visit to St. Joseph. I caught this year more than double what I caught last year with the same number of nets, and expect to catch more next season, and I think that the increase of fish is from the planting of whitefish fry, and I am heartily in favor of continuing the same, as the fish are getting more plentiful each year as your report from this station will show.

Very respectfully,
W. L. STEVENS.

WHITEFISH POINT, L. S., MICH., *Dec. 12, 1896.*

To the Honorable Board of Fish Commissioners, Detroit, Mich.:

GENTLEMEN—It gives us great pleasure to report to you the success of the planting of whitefish in our immediately vicinity, and we do not hesitate in saying that our catch has been heavier the past few years.

The question may arise on what do we base our authority for making such a remark, and it is briefly answered. The spawn which has been gathered from the Detroit river and the lower lakes and bays create a fish different from our regular Lake Superior whitefish, both in quality and form. We must say, however, that the original Lake Superior whitefish is superior and will also bear transportation better, as they seem more firm. We sincerely regret that the season for gathering spawn on this lake is so rough that it is next to an impossibility to do so.

Hoping that you will be able to continue your good work.

We remain, respectfully yours,
C. ENDRESS & SONS.

ST. JAMES, BEAVER ISLAND, MICH., *Dec. 19, 1896.*

DEAR SIR—I found you letter on my return from Chicago and noted contents. From my observation the propagation of fish has helped to increase the whitefish, and they would be increased still further if the mesh of pound nets was 4 inches and all employed in the fishing business were forced to comply with the law. We had a good catch this fall.

Yours truly,
JAMES McCANN.

DETOUR, MICH., *Dec. 30, 1896.*

DEAR SIR—You asked me to write you what I thought of the success of the planting of what we call hatchery fish. From the expressions heard on all sides from our fishermen here, there is no doubt but what it is a success. We see it more in the whitefish than in the trout, as whitefish have been getting scarce every year for a number of years and our men claim that most all they catch now are hatchery whitefish, and it would disappoint us in more ways than one if the planting of them was stopped, which I hope it will not be.

I am yours respectfully,

JAS. T. BENNETT.

ST. JOSEPH, MICH., *May 22, 1895.*

We, the undersigned, residents of this city, for the past twenty years or more, have during all those years been actively engaged in fishing either with pound nets or gill nets out of this station in Lake Michigan and having noted the gradual decline of our yearly catches, are most decidedly of the opinion and belief that unless immediate protection is given to whitefish and lake trout, the waters of our great lakes will in the near future become practically depleted of these kinds, thereby destroying a most valuable industry. Therefore we would suggest that the State of Michigan adopt wholesome laws with this end in view, and we hereby pledge ourselves to support the same and co-operate with the State Fish Commissioners in framing a law to protect the immature whitefish and lake trout, also a close season during the spawning period of these two most valuable kinds of our lake fish.

HABIEL BROS. & CO.,
WM. HABIEL,
H. MOLLHAGEN,
ALEX. CRAU,
AMIL RISTO,
C. MOLLHAGEN & SONS,
H. O. WILSON,
COLLUM RIGNEY.

All the above signatures are St. Joe fishermen.

[From Detroit Evening News, Dec. 23, 1892.]

RAISING WHITEFISH.

E. A. DAVIS DEFENDS THE WORK OF THE FISH HATCHERIES.

TO THE EDITOR—I cannot help replying to the interview in your paper of the 22d inst., contributed by C. W. Gauthier, the wholesale fish dealer of Windsor, on fish fry. While Mr. Gauthier has been a catcher of fish all his life, I think his experience in the propagation of fish is very limited. I have experimented considerably in the raising of whitefish artificially hatched, and have obtained my fish fry from the government hatcheries. Of 2,000,000 young whitefish which I planted last April, I will venture to say 90% are alive today and thriving hale and hearty. If the gentleman can spend the time, I would be pleased to have him join me the fore part of January and I will take pleasure in showing him the little fish all alive. I will not attempt to answer his entire attack on the International Fisheries Conference, but I think he is doing them a great injustice. If it were not for the fish commission and the artificial propagation of whitefish, I think Mr. Gauthier would find whitefish a great deal scarcer than they are today in our lakes.

I have given fish culture a great deal of study in the last twelve years, as well as being a practical fisherman and I consider Mr. Gauthier away off, and can prove to him that he is.

E. A. DAVIS.

Detroit, Dec. 23, 1892.

BAY CITY, MICH., *Jan. 6, 1897.*

C. H. Moore, Detroit, Mich.:

DEAR SIR—Here are the whitefish. No charge on our part. Pardon delay. I have been more than busy and am yet.

These are smallest we have and fully twice as large as the usual run of small 8 white.

I am with you if this business can be stopped.

Yours truly,
D. A. TRUMPOUR.

ST. IGNACE, MICH., *Jan. 22, 1897.*

Mr. Herschel Whitaker, Detroit:

DEAR SIR—Your favor of the 22d inst. is received. In reply would say that we have no fish of the kind you desire on hand at present. All our fish were shipped to Chicago and stored there last fall to save freight by rail during the winter.

In the 400 half barrels we have there it is very doubtful if there is any of the kind you mention, unless they are mixed with herring. As you are aware, very few if any, are caught during the fall months. The spring and early summer is the time small whitefish are taken in large quantities.

Wish you ever success in your fight with the commercial fishermen, who care nothing for the propagation of fish when such propagation seems to conflict with their own individual gains.

I remain,
Sincerely yours,
M. CHAMBERS.

ST. IGNACE, MICH:, *Feb. 16, 1897.*

Herschel Whitaker, Esq., Pres. Mich. Fish Commission, Detroit:

DEAR SIR—Yours of 9th received and in response to your queries will say, that in my opinion the principal abuses of the fisheries is in the use of small mesh in pound nets; the taking of the small fish during the months of June and July, when they come on the grounds to feed; the taking of fish in the fall on the spawning grounds (say from 20th October to 20th November); also, another, and in my opinion one of the greatest abuses, is the fishing with tugs and throwing the offal into the lake, as the decay of such offal will drive the whitefish from their feeding grounds.

My experience with the small mesh, briefly stated, is as follows: I commenced to fish pound nets in 1860 with a mesh of pot or crib of 2½ inch. That season until 1st September caught 750½ barrels, 400 of which were No. 2's and 3's. The next season, on the same grounds, I caught 400½ barrels, 100 of which were No. 1's. The third season I rented the same gounds and the parties did not get 50 pkgs. It then became apparent to me that the small mesh was destroying the fish by killing off the young fish, and from that time I kept enlarging the mesh from 2½ to 3½ inches, until 1880, when I formed a copartnership with Mr. Goodreau of Epoufette. My twine was getting poor, necessitating new pots. Without consulting Goodreau, I got 4-inch mesh for pots, and the first lift I made with them I got 17 pkgs. and Goodreau got 24 pkgs. with his old nets. He considered I had done him an injury by getting so large a mesh, as he was getting ⅓ more fish than I was, and had to divide equally. We owned together 2½ miles of shore, divided the same, I taking the west and he the east portion. He kept on fishing the 2½ and 3½ inch nets until 1890, and the last four years he did not catch fish enough to pay for the stakes. I fished my ground during the same time with the 4-inch mesh and there never was a season that it did not pay me well until 1893, when others, finding out I was fishing over a mile from shore, and consequently had as good a right to the ground as I, they set 2 and 3½ inch mesh nets alongside of me, and caught as many No. 1's as I did and put up 500½ barrels No. 2. They have continued to fish alongside of me every year since then, and the ground has failed each year. My opinion is, and in the light of experience I honestly believe, that if this ruinous practice is persisted in, in ten years time whitefish will be as scarce as oranges in Alaska.

To correct these abuses, stringent laws should be enacted, prohibiting the fishing of pound nets having less than 4 inch mesh in pots, and maintaining a close season from the 15th of October to the 20th of December in each year.

In regard to propagating fish, I am satisfied it is a good thing, as from my observation they have nearly all lived that were put in the lake by the Fish Commission. I base my opinion on the ground, that, where they have been planted there has been great numbers of small fish caught two years after, all uniform in size, and in places where there had been no fish caught in years; also they are somewhat different in make or form; they are thicker than the lake fish, according to the length.

In conclusion will say that if the health of my family and business will permit, I will be pleased to meet you at Lansing, upon notification.

JOHN R. McLEOD.

MANISTIQUE, MICH., *Dec. 8, 1896.*

Michigan Fish Commission:

GENTLEMEN—Thought I would drop you a few lines as there is some in doubt to the benefit derived in planting fish. I have been engaged in tug fishing for the past 18 years and have marked the increase on grounds that had been fished out before they commenced planting fish.

I have been in the employ of the A. Booth P. K. G. Co. for the last five years out of Manistique, and have planted each spring on grounds where there used to be fish years ago, but of late there was none until the last three years and this fall fishing was better than the two previous years and those fish I speak of are mostly whitefish and altogether like the Lake Erie fish. They are all about of a size and have no spawn in them. That is the reason I am positive they are planted fish. We also get small trout.

I have fished all the lakes and have found it the same all over from four to five years after they commenced planting fish, more so on inside grounds.

Yours truly,

CAPT. JOHN NOLAN.

ST. JAMES, MICH., *Dec. 23, 1896.*

Michigan Fish Commission, Detroit, Mich.:

GENTS—I have been called on, and I think it is a great duty to give my experience this 25 years on Lake Michigan and ten years on the ocean, but in particular of the decline of our great industry on our lakes here.

First, in 1870, when I came on these lakes, it was then new and wherever you put out nets you got whitefish and trout. They are very scarce now and I will give my reasons for the decline. Will commence at Manistique, where you could get 100 pounds to a net clear to Seul Choix. Now it is a failure. Why? The whitefish is a clean fish and feeds on feeding grounds in certain seasons of the year and on worms. They commenced dumping sawdust in the river at Manistique, which floated away in fields like fields of ice till it got water soaked and sank. Wherever this body of rank filth and dust covered the feeding ground, the fish had to go away and the young ones starved in my opinion, as their nature is like any other worm of this earth, and this would·be on the same principle it would be to plow up a pasture field where there would be a flock of sheep. They go in schools on these grounds till they are banished.

The planting of whitefish commenced from our great hatchery, which has been a great benefit, more than any one is aware of, but what is the use of planting them when they are caught from the time they grow to be about two ounces to one pound in weight, so they have no chance to multiply till they are destroyed. Why are they destroyed? There has been a scheme got up to fish hooks and get bait for them, what they call bloaters, when cut bait would do as well. When you plant fish in Lake Michigan, or their natural spawn, no matter where you plant them, the young fry go together, and when they grow up they go in droves in deep water to find calm and they feed on the sides of those steep banks that are clear of filth. Then they get nets out to catch bait in those places, nets of three-quarters of an inch mesh, and get them as thick as the net can hold, of which 90% is young whitefish, and those that don't care call them bloaters, and make some fools believe that they never grow any larger. Of course this is all right to tell to a farmer in the State of Michigan, but it don't do to tell men of experience.

We here last fall got up two nets to catch bloaters for bait and we got in those puddles, 30 and 35 fathoms deep. Those nets, when we raised them, were as thick with fish so that they looked like the driven snow. Come to examine them, 90% was whitefish. The consequence was we took the nets and gave them away on the other side of the lake, as we saw we were going to destroy what we were making a living out of. It is a shame that the State would spend money today to plant fish from their hatchery and next day have them destroyed. Now they grow up to be a half pound weight and one pound, and the second year they come on the shoals and around the beach in July and August according to nature, and they get into trap nets and are caught and they don't amount to anything. It takes about 150 to 200 in count to make a hundred pounds, and they are sold for the price of barrels and salt, when if they were left one year longer, they would be all right and of some benefit to our community.

Now then the Honorable Board of Fish Commissioners should look this matter over careful to not allow any trap nets in the waters of Lake Michigan not less than 4 inch mesh when tarred and in use, and not allow any gill nets to be set in Lake Michigan outside of one mile limit from the land of any less than 4⅛ inch mesh when in fishing order. This would increase our fisheries 300% in each year.

As to short season, there is no sense to it, as we have got to get the spawn, and there is not many whitefish caught. It is all those large trout.

I have seen out of small trap nets on this shore where one-half of the catch would go in the gut barrel, as they were too small to handle.

Now, the United States, and all our states should go together and protect our lakes in regulating our meshes, as our fishing industry is a great benefit to the rich and poor. They should make districts of these chains of lakes, appoint a man by the state, pay him his salary and look out that the law would be enforced. Why not protect our fisheries as well as our game, only one is to protect the poor, the other is sport for the rich.

Hoping that our legislature this winter will see to it to get good, intelligent men on the commission that have some experience in it—Mr. Moore that takes the State statistics, I presume you know, can give you more knowledge and information than I could write for a week, because he has a great deal of experience among fishermen and knows what they want. Such men should make those laws and not men that have no experience, same as you put me raising geese on a farm, I wouldn't know anything about it.

Any further information that I can give you that may be of any benefit to you, will do so at leisure.

Kind regards,

NEIL GALLAGHER,

St. James, Mich.

FAYETTE, MICH., *Dec. 11, 1896.*

Mr. C. H. Moore, Detroit, Mich.:

DEAR SIR—Yours of the 3rd inst. just at hand, and in reply I will say that to my knowledge the planting of the whitefish fry in Summer Island Passage has been a benefit, for these reasons. During the last four or five years there has not been but a very little whitefish caught, and this season they have been scattered all over the grounds, and we have caught considerable more than we had previously, and I believe they are the same ones that were planted here a few years ago. They are decidedly different from our old ones, being much larger and a different shape.

Hoping this will meet your approval, I am sincerely

Yours,

A. BARTRAM.

CHICAGO, *Feb. 13, 1897.*

B. D. Winegar, Esq., Escanaba, Mich.:

FRIEND WINEGAR—I am in receipt of your favor of the 12th in regard to fish bill, for which I thank you. I do not know what the bill before the legislature is, but I do know that the small trout and whitefish that are caught during the fall season should be stopped. In November, December and right up to the present time even, we are getting shipments of fresh caught trout in here with an average of a third small trout that do not weigh a quarter of a pound apiece. This is outrageous and something should be done to stop it. During an open season these small trout we figure are caught during the months of November, December, January and February.

We are heartily in favor of a close season, and also regulation that will stop the fishing of the small trout and whitefish, as well as a law to punish anybody having in their possession say any amount from 15 pounds up of these small fish, no matter where they get them from.

Shall get a copy of the fish bill and take pleasure in writing you further, but would say the fishermen have written us on the subject and we have declined to take any steps in regard to it. We have spent money heretofore and accomplished nothing. Now we will sit quietly back and see if any laws are passed that will do any good. Some laws should certainly be passed, and we would rather be hurt a little, that the general business may be benefited largely, if it should be necessary.

Again thanking you,

I remain very truly yours,

W. V. BOOTH.

MACKINAW CITY, MICH., *Dec. 6, 1896.*

Mr. C. H. Moore, Detroit, Mich:

Your welcome letter of 5th received this a. m. It gives me pleasure to answer same as the subject you present is one of great moment to all who are in any way interested in catching or handling whitefish. The nefarious practice of some of our best pound net fishermen of setting small mesh nets on whitefish grounds with the excuse of catching herring, and then taking large quantities of small whitefish that will not weigh ¼ pound each, dressing and salting them, and selling them for herring, bringing a price hardly sufficient to pay their help for caring for the fish. I have seen 3,000 pounds of these small whitefish that you could not find a dozen fish in the lot that would weigh over ¼ pounds each taken from one ground in St. Martin's Bay. From this ground in 1894 there was taken 5,300 lbs. small whitefish, very few herring mixed with the lot, which brought the fishermen $40.28 net. This is but a sample of the fishing that is done all over the lakes. From one fishery at Point Au Sable, I have seen small whitefish mixed with herring, and have taken out of a package eight fish that weighed one pound or just two ounces each. St. Martin's Bay and Point Au Sable both in 1893 yielded good fishing, fair catches of fair-sized whitefish being taken all through the season, but the greed of the fishermen impelled them to put small mesh backs in their nets so that not a single small fish could escape to grow for their next year's fishing. No amount of talk will convince these fishermen that they are working against their own interests. They say, "If we don't catch them, our neighbors will."

Since the good catches of 1893 in St. Martin's Bay and Point Au Sable and the robbing of the waters in 1894, there has not been whitefish enough caught on these grounds to pay for setting nets, and if there is not soon some stringent legislation enacted that will prohibit the taking of these small fish that are practically worthless both to the fishermen and consumer, the elegant Mackinaw whitefish known the world over, will be a thing of the past.

Had it not been for the good work done by our Fish Commission in planting whitefish fry, I feel certain that the waters hereabouts would have been depleted ere this. But the planting of young whitefish is practically useless unless some method is adopted to protect the fish until they attain a marketable size. In my opinion the best way possible to protect these fish is to enact laws prohibiting the use of nets on whitefish grounds of a less size than 3½ inch mesh and 4 inch would be a great deal better. It would cause a great deal of trouble no doubt to the fishermen and incur quite a large expense, but there is not one of them who would not feel the benefits in a few years' time, as the whitefish would certainly increase in numbers and in size. The trouble of most of the nets now in use is this, they were made at the factory 3½ inch mesh; now, after these nets are made up and soaked in coal tar, as all pound nets are, the mesh will not measure over 3¼ inches, and the second time they are tarred it will bring them nearer 3 inches, and the whitefish that will escape from one of these nets tarred the second time must be very small.

I have talked with a number of our larger fishermen owning rigs of their own, and they all express views similar to above, that if such laws were enacted and enforced it would be a good thing for all concerned, but when one is allowed the privilege of small mesh nets, the others feel it their duty to use the same. It certainly would be a great boon to the fishermen, fish dealers and consumers if the slaughter of small whitefish could be stopped, and I feel very confident that it would not be but a very few years before we would all see good results of planting whitefish. The only reason in the world we do not see good results at present is because the young fish are caught and dumped in with herring, no one knows how many, as they are never sorted over, and are all sold for herring, that is fish under ¼ lb. weight. I am very sorry we haven't a package of those small fish to send you, as I would like to have you see them for yourself, and to show to other members of the Commission.

I am, yours truly,

W. E. ROBINSON.

APPENDIX

FISH PLANTS, 1895-1896,

TEMPERATURES AND OTHER INFORMATION.

Whitefish Plants, 1895, from Detroit House.

Name of waters.	Where deposited.	Date.	Number.
Detroit River	Pain's Dock, Belle Isle	April 2	100,000
" "	East Point, Belle Isle	" 11	7,500,000
" "	Grassy Island	" 12	3,500,000
" "	Willis' Fishery, Belle Isle	" 12	7,000,000
" "	Grassy Island	" 13	3,500,000
" "	Willis' Fishery Belle Isle	" 13	3,500,000
" "	East Point, Belle Isle	" 14	3,500,000
" "	Grassy Island	" 15	3,500,000
" "	Willis' Fishery, Belle Isle	" 15	3,500,000
" "	Muskrat Point	" 16	3,500,000
" "	Willis' Fishery, Belle Isle	" 16	3,500,000
" "	Off upper end of Belle Island	" 16	3,500,000
" "	N. W. Side of Peche Island	" 16	3,500,000
" "	Grassy Island	" 19	3,500,000
" "	Off Peche Island	" 20	3,500,000
" "	One mile above East Point, Belle Isle	" 21	3,500,000
" "	East Point, Belle Isle	" 22	360,000
" "	East Point, Belle Isle	" 23	270,000
" "	East Point, Belle Isle	" 27	270,000
Lake Michigan	Frankfort, 8 miles northwest	" 6	2,000,000
" "	Frankfort, 8 miles west	" 10	2,000,000
" "	Ludington, 5 miles southwest	" 17	2,000,000
" "	Grand Haven	" 20	2,000,000
Lake Erie	Monroe, 3 miles northeast of mouth of Raisin River	" 9	3,000,000
" "	Monroe, near Stony Point	" 14	3,000,000
" "	Monroe, near Stony Point	" 15	3,000,000
Lake St. Clair	Grosse Point, ½ mile north of Light Ship	" 10	4,000,000
" " "	Grosse Point, 1½ mile north of Light Ship	" 14	3,500,000
" " "	Two miles north of Dummy Light	" 21	4,000,000
Straits of Mackinaw	Bois Blanc Island	" 12	2,000,000
Lake Huron	Three miles south of East Tawas	" 19	2,000,000
Total			93,500,000

Whitefish Plants, 1895, from Charlevoix House.

Name of waters.	Where deposited.	Date.	Number.
Lake Michigan	Seven miles west of Charlevoix	April 6	1,000,000
" "	Eight miles southwest of Charlevoix	" 7	2,000,000
" "	Five miles north by west off Fox Island	" 11	2,000,000
" "	Northwest of Cat Head Point	" 15	2,000,000
" "	Off Fisherman's Island	" 15	2,000,000
" "	Between Fisherman's Island and Norwood, 3 miles from shore	" 15	2,000,000
" "	Off Middle Village	" 17	1,000,000
" "	Three miles west of Norwood	" 17	2,000,000
" "	Off Cross Village	" 18	2,000,000
" "	Eight miles southwest from Charlevoix	" 19	2,000,000
" "	Mouth of Little Traverse Bay	" 20	2,000,000
" "	Five miles north of Charlevoix	" 20	2,000,000
" "	On Fisherman's Reef, 10 miles northwest of Charlevoix	" 20	2,000,000
" "	On reef 12 miles west of Charlevoix	" 20	2,000,000
" "	Manistee	" 23	2,000,000
" "	Three miles north of Charlevoix	" 25	1,000,000
Big Traverse bay	Old Mission Point	" 19	2,000,000
Pine lake	Charlevoix	" 25	1,000,000
Total			32,000,000

Whitefish Plants, 1895, from Sault Ste. Marie.

Name of waters.	Where deposited.	Date.	Number.
Hay lake	Hay Lake	April 25	1,200,000
Lake Superior	Marquette	“ 29	2,000,000
“ “	Mission	“ 30	1,200,000
“ “	Detour	May 1	2,000,000
“ “	Detour	“ 3	2,000,000
“ “	Manistique	“ 3	2,000,000
“ “	Whitefish Bay	“ 5	2,000,000
“ “	Escanaba	“ 5	2,000,000
“ “	Whitefish Point	“ 7	2,000,000
“ “	Whitefish Point	“ 9	2,000,000
“ “	L'Anse	“ 9	1,700,000
“ “	Manistique	“ 9	1,500,000
“ “	St. Ignace	“ 9	1,500,000
“ “	Hay Lake	“ 9	2,000,000
Total			25,100,000

RECAPITULATION.

From Detroit station	93,500,000
“ Charlevoix station	32,000,000
“ Sault Ste. Marie station	25,100,000
Total	150,600,000

Whitefish Plants, 1896, from Detroit House.

Name of waters.	Where deposited.	Date.	Number.
Detroit river	Belle Isle	April 1	1,440,000
“ “	Belle Isle	“ 2	360,000
“ “	Belle Isle	“ 2	750,000
Lake Michigan	Ludington	“ 8	2,000,000
Detroit river	Grassy Island	“ 9	2,510,000
“ “	Belle Isle	“ 10	2,510,000
Lake St Clair	Grosse Point	“ 11	2,510,000
Lake Huron	East Tawas	“ 12	2,000,000
Lake St Clair	Light Ship	“ 12	3,000,000
Detroit river	Belle Isle	“ 12	3,000,000
“ “	Belle Isle	“ 13	3,500,000
“ “	Belle Isle	“ 13	2,550,000
Lake St. Clair	Near Peche Island	“ 14	3,500,000
Lake Michigan	Manistee	“ 14	2,000,000
Detroit river	Belle Isle	“ 15	3,000,000
“ “	Fort Wayne	“ 15	3,000,000
Lake Michigan	Frankfort	“ 16	2,000,000
Lake St. Clair	Light Ship	“ 16	3,000,000
“ “ “	Above Peche Island	“ 17	3,000,000
“ “ “	Above Peche Island	“ 17	3,000,000
“ “ “	Light Ship	“ 18	3,000,000
Detroit river	Belle Isle	“ 18	3,000,000
Lake Erie	Monroe	“ 19	2,000,000
Lake Michigan	Grand Haven	“ 20	2,000,000
Detroit river	Belle Isle	“ 21	4,980,000
“ “	Belle Isle	“ 22	2,430,000
Total			66,040,000

Whitefish Plants, 1896, from Charlevoix Station.

Name of waters.	Where deposited.	Date.	Number.
Lake Michigan	Charlevoix	April 7	2,136,000
" "	Charlevoix	" 8	2,136,000
" "	Charlevoix	" 9	2,136,000
" "	Charlevoix	" 10	2,136,000
" "	Charlevoix	" 11	2,136,000
Little Traverse bay		" 12	2,136,000
Lake Michigan	Charlevoix	" 13	2,136,000
" "	Middle Village	" 14	2,136,000
" "	Charlevoix	" 16	2,136,000
" "	Fox Island	" 17	2,136,000
" "	Fox Island	" 21	2,136,000
Crystal lake		" 23	1,200,000
Lake Michigan	Charlevoix	" 24	936,000
" "	Charlevoix	" 25	936,000
" "	Charlevoix	" 26	936,000
" "	Beaver Harbor	" 27	936,000
Pine lake	Charlevoix	" 28	1,021,400
Total			29,461,400

Whitefish Plants, 1896, from Sault Ste. Marie Station.

Name of waters.	Where deposited.	Date.	Number.
Sault Rapids	Sault Ste. Marie	April 18 to May 18	9,500,000
Whitefish bay	Whitefish Bay	April 24	1,000,000
Lake Michigan	Detour	" 27	2,000,000
Hay lake	Hay Lake	" 28	1,000,000
Straits of Mackinaw	St. Ignace	May 7	1,500,000
" " "	Indian Mission	" 11	2,000,000
" " "	Manistique	April 27	2,000,000
" " "	Marquette	" 29	2,000,000
" " "	Manistique	May 3	2,000,000
" " "	Corinne	" 4	1,180,000
" " "	Escanaba	" 18	2,000,000
Total			26,180,000

RECAPITULATION.

From Detroit station	66,040,000
" Charlevoix station	29,461,400
" Sault Ste. Marie station	26,180,000
Total	121,681,400

Lake Trout Plants, 1895.

County and name of waters.	Township.	Depositor.	Date.	Number.
Alcona:				
Hubbard lake	Alcona	John Ellsworth	April 2	50,000
Clear lake	Haynes	Wm. Reynolds	" 2	15,000
Antrim:				
Intermediate lake	Several	J. K. V. Agnew	May 23	20,000
Torch lake	"	" "	" 21	20,000
Central lake	Central Lake	O. P. Barker	March 20	25,000
Baraga:				
King's Head lake	Covington	N. S. Pennock	May 10	15,000
Barry:				
Pine lake	Prairieville	Ed. J. Anderson	February 25	20,000
Benzie:				
Crystal lake	Benzonia and Crystal Lake	L. T. Van Winkle	March 18	25,000
Crab lake	Almira	Fred D. Curtis	" 20	15,000
Cass:				
Diamond lake	La Grange and others	James M. Shepard	" 26	25,000
Cheboygan:				
Douglass lake	Monroe	W. E. Ford	May 2	20,000
" "	"	W. B. Stimson	" 16	40,000
Chippewa:				
Trout lake	Trout Lake	N. A. Smith & Son	April 26	10,000
Lake Huron	Off Drummond's Isl'd	John Frook	May 2	10,000
Clare:				
Town Line lake	Hayes	Geo. M. Brown	April 1	15,000
Crooked lake	Surrey	" "	" 1	25,000
Emmet:				
Carp lake	Carp Lake	J. D. Bawdon	March 28	15,000
Bear lake	Bear Creek and oth'rs	W. B Stimson	" 28	30,000
Genesee:				
Long lake	Burton	James D. Johnson	April 5	10,000
Byron lake	Fenton	Anson Shotwell	" 5	10,000
Long lake	"	C. L. Turner	March 8	25,000
Goudy lake	Forest	Hiram Jones	" 9	15,000
Gogebic:				
Thousand Islands	41 N., 41 W.	Bent Bros.	April 27	8,000
Island lake	44 N., 40 W.	" "	" 27	10,000
Grand Traverse:				
Elk lake	Several	L. L. Lydell	March 20	50,000
Silver lake	Garfield and Blair	George Simpson	May 6	20,000
Hogsback lake	Mayfield	Fred D. Curtis	April 26	10,000
Lake Brewster	"	C. E. Brewster	" 12	10,000
Houghton:				
Lake on Sec. 17	Duncan	George H. Hauser	May 9	10,000
Lake Anne	Franklin	Lawrence Corrigan	" 10	9,000
Iosco:				
Goodar lake	Thompson	J. T. Guilford	April 2	15,000
Loon lake	Plainfield	Warren S. Hodges	" 2	20,000
Isabella:				
Lestrange lake	Lincoln	Birton I. Gee	" 15	10,000
Coldwater lake	Nottawa	Robert Hyslop	" 1	25,000
Jackson:				
Pleasant lake	Henrietta	A. W. Saxton	" 19	15,000

Lake Trout Plants, 1895.—Concluded.

County and name of waters.	Township.	Depositor.	Date.	Number.
Kalamazoo:				
Gull lake	Ross and others	J. T. Upjohn	March 25	25,000
Rawson or Barton lake	Schoolcraft	John E. Pabst	April 9	10,000
Paw Paw lake	Texas and Prairie Ronde	Albert Newkirk	February 26	10,000
Wood's lake	Kalamazoo	Theo. P. Bailey	" 25	25,000
Lake:				
Star lake	Lake	Wm. H. Baldwin, Jr.	March 15	20,000
Twin lake	Webber	" " "	" 15	10,000
Lapeer:				
Skinner lake	Oregon	Hiram Jones	" 9	10,000
Dipper lake	Deerfield	Andrew Brown	April 9	10,000
Leelanau:				
Davis lake	Kasson	T. J Newman	March 18	10,000
Glen lake	Glen Arbor and others	D. H. Day	" 18	20,000
Livingston:				
Long lake	Genoa	J W Lawson	February 20	10,000
Mackinac:				
Brevoort lake	Brevoort	M. F. Mulcrume	April 26	10,000
Marquette:				
Witch lake Sawyer lake	44, 45 and 30	H. Armstrong	" 27	15,000
" "	44, 45 and 30	" "	" 27	10,000
Witch lake	44, 45 and 30	" "	" 27	15,000
Long or Iron Mountain lake	44, 45 and 30	Geo. A. Newett	May 10	10,000
Mason:				
Gunn lake	Free Soil & Sherman	Wm. H. Baldwin, Jr.	" 18	10,000
Lincoln lake	Lincoln	" " "	" 15	10,000
Round lake	Sherman	Geo. M. Brown	" 18	10,000
Mecosta:				
Clear lake	Colfax	Geo. A. Roof	February 19	10,000
Montcalm:				
Crystal lake	Crystal	De Young & Worden	March 12	20,000
Baldwin lake	Eureka	T. I. Phelps	February 20	20,000
Whitefish lake	Pierson	C. W. Hartt	" 28	25,000
Edward's lake	Home	W. R. Jones	April 29	25,000
Newaygo:				
Brill's lake	Croton	Geo King	" 23	10,000
Fremont lake	Sheridan	T. P. Hopper	May 14	15,000
Hess lake	Garfield	Edwin O. Shaw	" 14	20,000
Crystal lake	Sherman	J. Mayo	" 14	10,000
Babtist lake	Ensley	Thomas Oliver	October 5 & 7	2,050
Oakland:				
Orchard lake	W. Bloomfield	Forest S. Campbell	March 8	20,000
Lake Elizabeth	Waterford	E. W. Abbott	" 8	20,000
Long lake	Bloomfield and W. Bloomfield	T. D. Seely	April 5	25,000
Ontonagon:				
Minnesota, National and Beamer dams	50 N., 39 W.	Benjamin Jeffs	May 9	6,000
Lake Gogebic	Ontonagon	E. Vliett	" 17	50,000
Otsego:				
Calkins lake	Charlton	O. H. Carpenter	" 3	20,000
St. Joseph:				
Clear lake	Fabius	H. H. Whipple	March 4	25,000
Corey lake	"	Ad. M. Shaffer	" 5	35,000
Van Buren:				
Eagle lake	Paw Paw	F. W. Thomas	April 10	25,000
Mud lake	Antwerp	C. F. Dey	March 26	10,000
Total				1,310,050

Lake Trout Plants, 1896.

County and name of waters.	Township.	Depositor.	Date.	Number.
Antrim:				
Bower's lake	Banks	C. S. Campbell	February 27	25,000
Wilson lake	"	" "	" 27	25,000
St. Clair lake	"	" "	" 27	25,000
Banwago lake	" & Centr'l Lake	" "	" 27	25,000
King's lake	" & Echo	" "	" 27	25,000
Sholes lake	" "	" "	" 27	25,000
Barry:				
Warren Hull lake	Baltimore	A. J. Houghtalin	" 13	25,000
Berrien:				
Paw Paw lake	Watervliet and Coleman	Geo. F. Collett	" 5	10,000
Cass:				
Mud lake	Calvin	I. R. Wright	" 6	10,000
Christian lake Juno lake	Ontwa	Manning Rogers	March 3	20,000
Painter lake	Calvin & Jefferson			
Charlevoix:				
Lake Michigan	Off Charlevoix	Mich. Fish Com	April 1	250,000
" "	" "	" " "	" 3	250,000
" "	" "	" " "	" 7	250,000
Chippewa:				
Detour passage	Detour	" " "	May 4	150,000
Espanore lake	Drummond	Chase S Osborne	" 4	25,000
Lake Superior	Whitefish Point	Mich. Fish Com	" 4	150,000
Whitefish bay	" "	" " "	" 4	122,000
Sault river	Sault Ste. Marie	" " "	" 4	2,000
Clare:				
West lake	Grant	O. S. Derby	March 17	20,000
Middle lake	Hatton	" "	" 17	20,000
Clinton:				
Round lake	Victor	J. C. Shaver	February 21	25,000
Crawford:				
K. P. lake	Maple Forest	George T. Owen	March 10	25,000
Shoepack lake	28 N., 1 W	Ed. O'Brien	" 10	25,000
Emmet:				
Crooked lake	Little Traverse	Thos. F. Austin	" 5	25,000
Genesee:				
Long lake	Fenton	J. W. McCullom	February 21	25,000
Gogebic:				
Lake Gogebic	Ontonagon & Gogebic	L. L. Wright	May 15	25,000
Grand Traverse:				
Silver lake	Garfield	Frank Frederick	March 13	25,000
" "	"	George Simpson	February 27	25,000
Houghton:				
Misery lake	Adams	Lawrence Corrigan	May 12	25,000
Isabella:				
Coldwater lake	Nottaway	Robert Hyslop	March 10	25,000
Kalamazoo:				
Asylum lake	Kalamazoo	Herman Ostrander	February 10	10,000
Hogsett lake	"	P. C. Pursel	March 3	10,000
Gull lake	Kearney and Kalamazoo	C. E. Foote	April 15	25,000
White's lake	Kalamazoo	" "	" 15	10,000

Lake Trout Plants, 1896.—CONCLUDED.

County and name of waters.	Township.	Depositor.	Date.	Number.
Lapeer:				
Miller lake	Deerfield	Will J. Till	February 18	25,000
Palmerlee lake	Lapeer	Chauncy Tibbetts	" 18	10,000
Otter lake Powderhorn lake Parke lake	Marathon	J. C. Mason	" 18	50,000
North lake	"	I. M. Fisher	" 18	25,000
Leelanau:				
Glen lake	Glen Arbor and others	D. H. Day	" 18	25,000
Lenawee:				
Sand lake	Franklin and Cambridge	J. J. Putnam & Sons	March 3	25,000
Devil's lake	Rollin and Woodstock	Geo. R. Beardsell	" 3	25,000
Mason:				
Round lake	Sheridan	C. O. Holmes	" 20	25,000
Montcalm:				
Hemingway lake	Day	E. S. Stebbins	February 15	25,000
Whitefish lake	Pierson	C. W. Hartt	March 25	25,000
Muskegon:				
Big Blue lake	Blue Lake	E. D. Magoon	February 22	25,000
Newaygo:				
Bill lake	Croton	George King	March 17	25,000
Oakland:				
Mace Day lake Lotus lake	Waterford	A. W. Blain	February 21	25,000
Ontonagon:				
Lake Gogebic	Ontonagon	J. M. Whitman	May 15	75,000
Otsego:				
Big lake	Chester	A. A. Crane	March 6	25,000
St. Joseph:				
Pleasant lake	Fabius	H. H. Whipple	February 6	25,000
Corey lake	"	J. H. Hahn	" 6	25,000
Crosman lake	Sherman	John McKerlie	March 26	15,000
Klinger's lake	White Pigeon	" "	" 26	35,000
Total				2,294,000

Brook Trout Plants, 1895.

County and name of waters.	Township.	Depositor.	Date.	Number.
Alcona:				
Black river	Haines	James E. Henderson	April 2	2,000
Mill creek	Harrisville	L. A. Colwell	" 2	5,000
Stony creek	Haines	Addison Silverthorn.	" 2	5,000
Backus creek	26 N., 8 E.	A. Backus, Jr.	" 2	4,000
Elm stream	Harrisville	H. W. Lyman	" 2	2,500
Indian river				
West Branch	26 N., 8 E.	A. Backus, Jr.	" 2	2,000
Dural creek	Mikado	C. W. Luce	" 2	8,000
Allegan:				
George's creek	Trowbridge	Edwy C. Reid	February 25	2,500
Dond's creek	Heath	" "	" 25	5,000
Clifford creek	Trowbridge	" "	" 25	2,500
Sink brook	Heath	" "	" 25	2,500
Bear creek	Monterey and Heath	" "	" 25	5,000
Mill creek	Monterey	" "	" 25	2,500
Sand creek	Pine Plains	" "	" 25	2,500
Spectacle brook	Monterey	" "	" 25	2,500
Indian stream	Wayland	John A. Turner	March 25	1,000
Cold Stream creek	Otsego	Buchanan R. Jones	" 25	2,000
Silver creek	Gun Plains	C. D. Stewart	" 25	2,500
Adsit creek	Watson	Fred Tubbs	" 25	2,000
Franklin creek	Alamo and Otsego	" "	" 25	3,000
White's creek	Gun Plains	Conrad Bros.	" 25	2,000
Adsit creek	Watson	H. D. Mills	" 25	5,000
Butter creek	Otsego & Gun Plains.	John N. Perkins	" 25	2,000
Spring Grove creek	Otsego	John D. Woobeck	" 25	2,000
Town Line creek	Pine Plains	Lafayette Stuch	February 25	5,000
Alpena:				
Crowell creek	Ossineke	W. E. Wright	April 2	8,000
Morse creek				
Gurkey creek	Sanborn	W. F. Haskin	" 2	5,000
Antrim:				
Wilson creek	Banks	Jeff. Bearrs	March 20	1,000
Dryer creek	"	" "	" 20	1,000
Dick creek	"	" "	" 20	3,000
Wood creek				
Boss creek	"	" "	" 20	2,500
Crampton creek	Central Lake	C. E. Ramsey	" 20	8,000
Wittse creek				
Burdeck creek				
Mohnmeau creek				
Cedar river and branches	Kearney and Custer	O. W. Kibby	" 20	12,000
Cold creek	" " "	" "	" 20	2,500
Cedar river	Kearney	Arthur Watkins	" 20	5,000
Cold creek				
Spencer creek	Helena	Main & Sanford	" 20	5,000
Arenac county:				
Branch of the Au Gres river	Turner	George Lewis	April 2	5,000
Barry:				
Britten creek	Barry	Calvin Stanton	February 14	2,000
Polly creek	"	" "	" 14	1,000
Stanley creek	Hastings	Luke Waters	" 14	2,000
West or Kenny creek	Rutland	Sidney A. Crowell	" 14	2,000
Kada creek	"	" "	" 14	2,000
Cherry creek	Hastings	" "	" 14	2,000
Butler's creek	"	" "	" 14	2,000
Lane's creek	Rutland	" "	" 14	2,000
Bentley's creek	"	" "	" 14	2,000
Fuller brook	Carlton	Kip Silsbee	" 14	1,000
Mangham creek	Baltimore	W. H. Spence	" 14	2,000
Kelley or Spence brook	"	" "	" 14	6,000
Big Spring brook	Barry	Jett Letts	" 14	1,000
Hill creek	Hastings	Jacob H. Neiss	" 14	2,500
Mitchell creek	Irving	" "	" 14	2,000
Leonard's creek	"	Luther S. Hills	" 14	1,000

Brook Trout Plants, 1895.—CONTINUED.

County and name of waters.	Township.	Depositor.	Date.	Number.
Barry—*Continued:*				
Fall creek	Hastings	W. D. Hayes	February 14	3,000
Ingram creek	Irving	John Kurtz	" 14	2,000
Horn creek	Johnstown	Charles Pritchard	" 14	1,000
Fisher's creek	Baltimore	" "	" 14	1,000
Prichard brook	"	" "	" 14	2,000
Tamarack creek	Hastings	Peter Cockburn	" 14	1,500
Stream on Secs. 33 and 28	Rutland	Thos. E. Waters	" 14	2,000
Stream on Sec. 15	Hastings	A. J. Sponable	" 14	2,000
Pratt creek	"	" "	" 14	2,500
Not named	Rutland	J. M. McElwain	" 14	1,500
Orr creek	Irving	" "	" 14	2,500
Mill creek	Carlton	" "	" 14	1,500
Haney creek	Rutland	" "	" 14	2,000
Stream on Sec. 24	"	F. H. Barlow	" 14	2,000
Stream on Sec. 33	"	" "	" 14	2,000
Erb creek	Hastings	Edmund Schuneman	" 14	2,000
Stream on Sec. 6	Johnstown	Francis Stanton	" 14	1,000
Linnington creek	Rutland	J. H. Linnington	" 14	1,000
Stream on Sec. 34	Carlton	R. K. Grant	" 14	1,000
High Bank creek	Baltimore	Isaac Powell	" 14	5,000
Glass creek	Rutland	E. G. Holbrook	" 14	2,500
Silver creek	Yankee Springs	Luther S. Hills	" 14	1,000
Glass creek	Irving	" "	" 14	3,000
Stream on Sec 31	Burlington	Edgar Fisher	" 14	1,500
Quaker brook	Maple Grove	Taylor Walker	" 14	5,000
Ellis brook	Assyria	P. K. Jewell	" 14	2,500
Salisbury creek	Orangeville	Eli Nichols	" 14	5,000
Griffin creek	Rutland	P. T. Colgrove	" 14	3,000
Kenfield creek	Hastings	" "	" 14	3,000
Heney, branch of West creek	Rutland	" "	" 14	3,000
Baraga:				
Slate river	Avon	N. S. Pennock	May 24	5,000
Pine creek	Baraga	" "	" 24	5,000
Carp river	"	" "	" 24	5,000
Benzie:				
Herring creek	Blaine	A. O. Wheeler	April 17	5,000
Cold Spring creek	Benzonia	L. T. Van Winkle	March 18	5,000
Eden Branch				
Cedar creek				
Little Betsey river	Weldon	C. Stein	" 18	4,000
Crystal creek	Benzonia	" "	" 18	2,000
Big Betsey river	Colfax	A. C. Wilkinson	" 20	7,500
Little Betsey river				
" " "	"	W. Cherryman	" 20	7,500
Clay Creek	Inland & Homestead	J. K. V. Agnew	" 20	8,000
Berrien:				
Tributary to Hickory creek	Lincoln & Royalton	J. H Hatch	February 26	2,000
Zearing's creek	Galien	D. F. Bommerscheim	" 26	2,000
Spring creek	Three Oaks	" "	" 26	2,000
Warren's creek	Chickaming	" "	" 26	2,000
Jeffries creek	Galien	Lyanges Jeffries	" 26	2,000
Kinnies creek	Three Oaks	D. F. Bommerscheim	" 28	2,000
Estes brook	Buchanan	L. L. Redden	" 26	1,000
Day brook				
Brandywine creek	Niles	Lewis H. Beeson	" 26	2,500
" "	"	Geo. W. Dougan	" 26	2,500
Lemon creek	Oronoko	Geo. Whitman	" 26	5,000
Branch:				
Riley's creek	Sherwood	W. H. Hubbard	May 5	3,000
Walter's Spring brook	California	M. G. Clarke	February 28	1,000
Porter's Spring brook	"	Ed. J. Allen	" 28	1,000
Stream on Sec. 2	Kinderhook	Albert A. Dorrance	" 28	1,000
Shinneman's creek	Batavia	Henry H. Barlow	" 28	2,000
Crooked creek	Kinderhook	C. D. Warner	" 28	3,000
Noble creek	Noble	" "	" 28	3,000
Stream on Secs. 1 and 2	Kinderhook	" "	" 28	1,000
Vincents' brook	Girard	L. M. Wing	" 28	1,000
Calhoun:				
Pine creek	Athens & LeRoy	W. H. Hubbard	March 5	2,500
Alder creek	Burlington & Newton	Zachariah Little	" 5	2,500
Harsh creek	Burlington	Cyrenius B. Knight	" 5	2,500
Sanders' creek	"	Edson Treadwell	" 5	2,000

Brook Trout Plants, 1895.—Continued.

County and name of waters.	Township.	Depositor.	Date.	Number.
Calhoun—*Continued:*				
Wormley's creek	Marshall	J. F. Garwood	March 4	2,500
Enos brook	"	" "	" 4	2,500
Knight's creek	"	" "	" 4	2,000
Tamarack creek	"	" "	" 4	1,000
Loomis creek	Eckford	" "	" 4	4,000
Pigeon creek	Marshall	" "	" 4	2,000
Pigeon creek	Eckford	" "	" 4	2,500
Cass:				
Jones creek	La Grange	C. H. Kimmerlee	" 26	3,000
Sharpe's creek	Jefferson	" "	" 26	2,000
Stephenson creek	"	" "	" 26	2,000
Pokagon creek	Pokagon & Howard	" "	" 26	2,000
Centennial Mills creek	La Grange & Jeffers'n	" "	" 26	2,000
Shaw's creek	Jefferson & Howard	" "	" 26	2,000
Smith's creek	" "	" "	" 26	4,000
Conklin creek	Marcellus	E. P. McKenzie	" 26	2,500
Spring brook	Newbury	C. S. Jones	" 26	1,000
Big creek	Marcellus	W. L. Arnold	" 26	5,000
No name	"	" "	" 26	2,000
Mechanicsburg creek	La Grange	A. B. Atwater	" 26	3,000
Stream on Secs. 24 and 25	Jefferson	Edward Keegan	" 26	3,000
Smith's creek	"	S. S. Congdon	" 26	1,000
Hadsell's creek	Jefferson & Howard	John Congdon	" 26	2,000
Stream on Secs. 27, 28 and 33	La Grange	A. M. Kingsbury	" 26	2,500
Schutte's creek	Jefferson	S. C. Thorpe	" 26	2,500
Spring Lake creek	"	" "	" 26	2,000
Pea Vine creek	Pokagon	F. L. Colby	February 26	2,500
Brandywine creek	Howard	Lewis H. Beeson	" 26	2,500
Charlevoix:				
Ironwood creek	Norwood	L. D. Bartholemew	March 20	2,500
McGeogh creek	Marion	" "	" 20	2,500
Stover's creek	Charlevoix	" "	" 20	2,500
Spring brook, br. of Bear river	Melrose	W. B. Stimson	" 28	5,000
Cheboygan:				
Spring creek	Burt	Wm. Hawkins	" 22	2,000
Middle branch of Little Sturgeon river	T. 34 and 35 N., R. 2 W.	Henry J. Graves	" 22	3,000
Cold Creek	T. 35 N., R. 2 W.	" "	" 22	1,000
Mett creek	Hebron	John Reycraft, M. D.	" 22	2,000
Stewart creek	T. 33 N., R. 2 W.	R. H. L'Hommedieu	" 22	12,000
Chippewa:				
Sault Ste. Marie river		Mich. Fish Com.	May 9	148,000
" " " "		" " "	" 18	15,000
Bear creek	Rudyard	John H. D. Everett	" 15	12,000
Clare:				
No name	Surrey	Nat D. Watkins	April 1	3,000
Headwaters of the Chippewa river and its branches	"	John Van Valkenburg	" 1	10,000
Several lakes and streams on Secs. 8, 9, 16, 20 and 33	T. 17 N., R. 4 W.	Geo. M. Brown	" 1	3,000
Silver creek	T. 17 N., R. 4 W.	" "	" 1	4,000
South branch of Tobacco river	Several townships	H. C. Potter	" 1	6,000
Middle " " " "	" "	W. B. Mershon	" 1	7,500
Newton creek	Surrey	E. H. Smith	" 1	3,000
Chippewa river	Several	C. H. Davis	" 1	6,000
Dock and Lowe creek	Surrey	Harry T. Wickes	" 1	10,000
North branch of Tobacco river	Several	Wm. F. Potter	" 1	10,000
Clinton:				
Meadow brook	Eagle	Frank S. Byam	March 21	2,500
Coon creek	Middleburg and Siota	J. A. Valentine	" 12	5,000
Post creek	Victor	Elisha F. Edwards	" 12	3,000
Little Maple river	Ovid	F. D. Cleveland	" 12	4,000
Crawford:				
East branch of Au Sable river	T. 27 N., R. 3 W.	R. H. L'Hommedieu	" 22	15,000
Br. of S. br. " " "	Center Plains	" "	" 22	15,000
North bra'ch " " "	T. 28 N., R. 1 W.	" "	" 22	18,000
Delta:				
Day's river	Mas'nville & Baldwin	Richard H. Mertz	April 27	9,000

Brook Trout Plants, 1895.—CONTINUED.

County and name of waters.	Township.	Depositor.	Date.	Number.
Eaton:				
Sand brook	Vermontville	Benjamin Haight	February 14	3,000
Jordan brook	Chester	F. S. Jordan	" 14	2,000
Mill creek	Walton and Lee	Samuel Curtis	" 28	8,000
Town Line brook	Walton and Carmel	E. R. Moran	" 28	4,000
Emmet:				
Minnehaha creek	Littlefield	W. B. Stimson	March 28	5,000
Maple river	Pellston	" "	" 28	12,000
Town Line creek	Oden	" "	" 28	4,000
Syder creek	"	" "	" 28	4,000
Conway Spring brook	"	" "	" 28	4,000
Bear river	Clarion	" "	" 28	10,000
Bird's Eye creek	Littlefield	" "	" 28	6,000
Gladwin:				
Sugar river	Butman & Sherman	Geo. M. Brown	April 1	10,000
Cedar creek	Beaverton and others	F. L. Prindle	March 22	6,000
McNellie creek	Sage	" "	" 22	3,000
Gogebic:				
Maple creek	Ironwood	Chas. M. Winter	April 27	3,000
Duck creek	Watersmeet	A. D. Johnston	" 27	3,000
" "	"	L. L. Wright	" 27	3,000
Ontonagon river	"	" "	" 27	3,000
Little Presque Isle river	"	" "	" 27	5,000
Powder Mill creek	Bessemer	Thos. Kissane	" 21	3,000
Welch creek	Ironwood	L. C. Walker	" 27	3,000
East br. of Presque Isle river	Marenisco	L. L. Wright	" 27	3,000
Black river	Bessemer	" "	" 27	3,000
Steam on Secs. 9, 16, 17	T. 46 N., 43 W.	" "	" 27	1,500
Not named	Ironwood	" "	" 27	4,000
Montreal river	"	" "	" 27	4,000
Hammond's creek	"	" "	" 27	3,000
Ontonagon river	Watersmeet	A. D. Johnston	" 27	3,000
Grand Traverse:				
Boardman river	Whitewater	L. L. Lydell	March 20	20,000
Mill creek	"	" "	" 20	2,000
Keiser's creek	"			
Barker creek	"	" "	" 20	4,500
Mill creek	"			
Whitewater creek	"			
Tributary to Platte river	Long Lake	Jeremiah M. Thomas	" 20	5,000
Crane's creek	Blair & Green Lake	D E. Crandall	" 20	1,000
Hillsdale:				
Bear creek	Cambria	Ed. D. Babcock	February 28	2,000
Harrison's creek	"	M. G. Mallery	" 28	1,000
Headwaters of St. Joseph river	Jefferson	Marion G. Mosher	" 28	2,500
Fellow's creek	Pittsford	James B. Thorn	" 28	3,000
Britton's creek	"	" "	" 28	8,000
Bean creek	"			
Hillsdale creek	"			
Houghton:				
Salmon Trout creek	Adams and Hancock	N. E. McBride	May 24	3,600
Stoll's creek	Hancock	A. R. Gray	" 24	3,600
Cole's creek	Adams and Hancock	J. A Hubbell	" 24	3,600
Swede Town creek	" " "	James B. Sturgis	" 24	3,600
Graveract creek	Hancock	J. F. Bowden	" 24	3,600
Sidnaw creek	47 N., 35 W.	Geo. H. Houser	" 24	5,000
Breauno river	Laird	Leonard Gillespie	" 24	4,000
Huron:				
Willow Spring brook	Verona	J. B. Madill	April 10	6,000
Ingham:				
Seely's creek	Delta and Lansing	Dewey A. Seely	February 20	3,000
Ionia:				
Prison creek and ponds	Ionia	Otis Fuller	April 7	500
Cryderman creek	Darby	W. D. Crane	February 20	1,000
Stocking's creek	Otisco	H. J. Leonard	" 20	2,500
Common's Mill pond				
Popple creek	Ronald	H. E. Howarth	March 12	4,000

Brook Trout Plants, 1895.—CONTINUED.

County and name of waters.	Township.	Depositor.	Date.	Number.
Iosco:				
Coal creek	An Sable	C. R. Henry	April 2	6,000
Spring brook	Wilber			
Indian creek	Oscoda	John Tadgahsong	" 2	8,000
Sims creek	Tawas and Baldwin	C. W. Luce	" 2	5,000
Cold creek	" " "	" "	" 2	6,000
Gailey creek	Plainfield	" "	" 2	8,000
Smith creek	Plainfield, Grant and Sherwood	" "	" 2	8,000
East branch of Au Gres river	Plainfield, Grant and Sherwood	" "	" 2	16,000
Isabella:				
Pumphrey creek	Rolland	J. K. V. Agnew	March 12	4,000
Skunk creek	"	" "	" 12	18,000
" "	"	W. R. Jones	" 12	12,000
Child's creek	Coe	L. D. Estee	" 13	8,000
Cedar creek	Lincoln			
No. branch of Chippewa river	Gilmore	C. H. Freeman	" 1	2,500
Onion creek	Chippewa	Geo. L. Granger	" 1	6,000
Mission creek	Union	" "	" 1	6,000
Healey creek	Deerfield	" "	" 1	3,000
Johnson creek	Union	Warner Churchill	" 1	2,500
Notaway creek	Notawa	Geo. L. Granger	" 1	5,000
North branch of Cedar creek				
Jackson:				
Muckey creek	Rives	Grove H. Wolcott	February 14	2,500
Kipps brook	Summit	George Meister	" 14	2,000
Mills creek	"	" "	" 14	3,000
Crouch creek	"	" "	" 14	3,000
Not named	Summit & Liberty	J. G. O'Dwyer	" 14	2,000
Locher stream	Grass Lake & Waterloo	D. W. Clark	" 14	3,000
Spring brook	Spring Arbor & Concord	F. C. Courter	March 4	5,000
R. R. pond	Rives	Will D. Casey	" 5	1,000
Cleland stream	Hanover	W. W. Dew	" 5	2,500
Williams' creek	"	A. S. Ambrose, M. D.	" 5	2,000
Thompson's Spring brook	"	Eugene Strait	" 5	3,000
Townsend Spring brook	"	" "	" 5	2,500
Trib. to Grand river, on Sec. 23	Liberty	Chas. Van Schoick	" 5	6,500
Wheaton spring	Hanover	E. S. Heath	" 5	1,500
Gillets creek	Springport	F. C. Courter	" 4	3,000
Spring creek	Parma	" "	" 4	5,000
Kalamazoo:				
Klein brook	Flowerfield	Chas. W. D. Allen	February 28	5,000
Chamberlain creek	Prairie Ronde	John E. Pabst	" 20	5,000
Bly creek	" "	Henry I. Allen	" 28	5,000
Cogles creek	" "	W. C. Kohl	" 28	1,000
Taylor's creek	Schoolcraft	John Harrison, Jr.	" 28	2,000
Frakes creek	"	J. W. McElwain	" 28	2,500
Little Portage creek	Wakeshma	C. Z. Hasbrouck	" 28	5,000
Pierce and Bellows creeks	Charleston & Climax	H. Dale Adams	March 4	4,000
Ridler and Earl creeks	Charleston & Comstock	" "	" 4	3,000
Hinton creek	Ross	" "	" 4	3,000
Eagle or Streator creek	Charleston & Ross	Harry D. Streator	" 4	4,000
Dixon's creek	Alamo	Fred Tubbs	February 25	3,000
Pine creek	"	G. E. Barden	" 25	9,000
Little Portage creek	Texas & Kalamazoo	A. J. Stevens	" 25	2,500
Silver creek	Alamo	Ed J. Anderson	" 25	5,000
Seely's creek				
Brown creek				
Duncan creek				
Not given		A. L. Lakey	May 21	3,000
Kalkaska:				
Rapid river	Rapid River	W. B. Stimson	" 28	12,000
South br. of Boardman river	Boardman	" "	" 28	15,000
Middle br. of Boardman river	"	" "	" 28	5,000
North br. of Boardman river	Kalkaska	" "	" 28	10,000
Rapid river	Rapid River	" "	" 28	7,000
Kent:				
Whitney creek	Plainfield	D. L. Stevens	April 8	3,000
Stegman creek	Courtland & Algoma	F. E. Wright	February 27	2,500
Shaw creek	" " "	" "	" 27	2,000

Brook Trout Plants, 1895.—Continued.

County and name of waters.	Township.	Depositor.	Date.	Number.
Kent.—*Continued:*				
Rum creek	Courtland & Algoma	F. E. Wright	February 27	2,000
Barkely creek	Cannon & Plainfield	“ “	“ 27	2,500
Tanner creek	Algoma	Robert Carlyle	“ 27	1,500
Barclay creek Leache creek	Cannon & Plainfield	“ “	“ 27	2,500
Hutchins creek	Algoma & Plainfield	“ “	“ 27	1,500
Austin creek	Courtland	“ “	“ 27	2,000
Baker creek	Cannon	“ “	“ 27	2,000
Little Cedar creek	Courtland & Algoma	W. H. Wheeler	“ 27	7,500
Silver creek	Tyrone & Sparta	C. C. Darling	March 14	2,000
Ball creek	“ “ “	“ “	“ 14	2,000
Sparta creek	Sparta	“ “	“ 14	2,500
No name	No. part of Tyrone	J. S. Ingram	“ 14	1,000
Tributary to Bear creek	Byron	Frank Narregaug	February 26	2,000
Butternut creek	Byron & Gaines	“ “	“ 26	2,000
Tributary to Rush creek	Byron	“ “	“ 26	1,000
Beaver Dam creek	“	“ “	“ 26	2,000
Smith's creek	Caledonia	D. W. Dutcher	“ 14	2,000
Stream on Sec. 24	“	“ “	“ 14	2,000
Becker creek	Courtland	Henry Parkinson	“ 25	2,000
Rogue river	Plainfield	W. B Stimson	March 25	10,000
Shaw's creek	Algoma	“ “	“ 25	5,000
Edgerton creek	“	“ “	“ 25	10,000
Lake:				
Br. of Little Manistee river	Ellsworth	H H Morley	“ 14	2,500
Little Sweetwater creek	Elk	J. S. Stearns	“ 15	6,000
Buck creek	Lake & Branch	C. H. Bates	“ 18	2,000
Little Manistee river	Center	“ “	“ 18	2,000
West br. of Dannaher creek	Pleasant Plains	J. F. Brand	“ 18	2,000
Bowman creek	Lake	C. H. Bates	“ 18	2,000
North Branch	19 and 20 N., 12 W.	A. Patriarche	“ 18	5,000
Little Manistee river	19 N., 13 W.	“ “	“ 18	4,000
Avery creek	Cherry Valley	W. A. Avery	“ 18	3,000
Daniher creek	Pleasant Plains	L. A. Carpenter	“ 18	1,500
Sanborn creek	Three Towns	B B. Mitchell	“ 18	5,000
Middle branch of Pere Marquette	“ “	R. H. L'Hommedieu	“ 18	4,000
Lacey creek	Yates	“ “	“ 18	3,000
Irons creek	Elm & Elk	J. K. V. Agnew	“ 20	12,000
Little Danaher creek	Plains	“ “	“ 20	5,000
Little Manistee river	Ellsworth	W. B. Stimson	“ 28	10,000
Lapeer:				
Dutch creek	Oregon	Hiram Jones	“ 9	3,000
Webster creek	Hadley	M. F. Hemmingway	“ 9	5,000
Brocker creek	“	“ “	“ 9	2,500
Hemmingway creek	“	“ “	“ 9	2,500
Branch of Hunters' creek	Lapeer	C. A. Smith	“ 9	2,500
Farmers' creek	Metamora & Hadley	R. B. Conklin	“ 9	8,000
Branch of Farmers' creek	“ “ “	Jesse Lee	“ 9	3,000
Leelanau:				
Streams and pond on Secs. 3, 4 and 32	Leelanau	N. E. DeGolier	“ 20	5,000
Lenawee:				
Woodward creek	Franklin	H. H. Halladay	“ 5	2,500
Evans creek	Franklin & Tecumseh	M. J. Pierce	“ 5	6,000
Livingston:				
Cedar creek	Marion	Daniel O. Smith	February 20	7,500
Macomb:				
Troop creek	Bruce	H. W. Bradley	March 8	2,000
Eldred's creek	“	“ “	“ 8	2,000
Streetor's creek	“	“ “	“ 8	2,000
Smith creek	Washington	“ “	“ 8	2,000
Stream on Secs. 4 and 33	Bruce	“ “	“ 8	2,000
Frost's creek	Washington	“ “	“ 8	2,000
Mackinac:				
Coldman creek	Garfield	Wm. Hudson	April 26	3,000
Carp river	St. Ignace	W. M. Spice	“ 26	9,000
Cool creek	Garfield	Wm. Hudson	“ 26	3,000

Brook Trout Plants, 1895.—CONTINUED.

County and name of waters.	Township.	Depositor.	Date.	Number.
Manistee:				
Kill or Kinnie creek	Brownstown	C. Stein	March 18	2,000
Conger creek	Maple Grove	J. K. V. Agnew	" 20	10,000
Corfu creek	Brown	" "	" 20	4,000
Bear creek branch	Cleon	W. R. Smith	" 18	3,000
Gable creek	"	" "	" 18	3,000
Seder creek	Maple Grove	Alfred H. Mills	" 18	6,000
Marquette:				
Little Falls creek	Republic	Peter Pascoe	May 24	6,000
North branch of west branch of Escanaba river	Tilden and Palmer	Geo. A. Newitt	" 24	6,000
Mason:				
Lincoln creek	19 N., 15 W.	Geo. M. Brown	March 18	5,000
Big Sable	20 N., 15 W.	Wm. H. Baldwin, Jr.	" 18	15,000
Weldon creek	Branch	Farnham Lyon	" 18	3,000
Dan Whalen's creek	Amber	Valentine R. Penny	" 18	3,000
Geobolt's creek	"	" "	" 18	3,000
Upper Weldon creek	Branch	Henry C. Rawson	" 15	3,000
Mecosta:				
Black creek	Millbrook	J. K. V. Agnew	" 12	5,000
Little Chippewa river	Sheridan	" "	" 12	8,000
Bambee creek	"	" "	" 12	5,000
Randy branch	Martiny & Chippewa	" "	" 12	12,000
Marshfield creek	Colfax	J. W. Meller	" 12	8,000
Pointer creek	Wheatland & Norton	J. K. V. Agnew	" 12	4,000
Hughes creek	Martiny	" "	" 12	7,000
Stream on Secs. 17 and 20	Chippewa	James A. Roof	" 12	1,500
Roundy creek	"	" "	" 12	2,500
Black Lake creek	Millbrook & Belvidere	Lorenzo D. Decker	" 12	2,000
Black creek	" "	H. Cogswell	" 12	4,000
Mack's creek		W. B. Stimson	February 19	7,000
West branch of Pine river	Millbrook & Rolland.	N. C. Mason	March 12	5,000
Little Muskegon	Deerfield	W. B. Stimson	" 25	10,000
Borland creek	Ætna	" "	" 25	10,000
Midland:				
Warner's creek	Geneva	L. F. Babcock	April 1	2,500
Bluff creek	Jerome and Warren.	" "	" 1	8,000
Babcock creek	Geneva	" "	" 1	1,000
Missaukee:				
Wallis creek	Lake	G. W. Crosby	March 28	4,000
Clam creek	Lucas	D. B. Kelley	" 13	15,000
Montcalm:				
Town Line Lake creek	Belvidere	J. K. V. Agnew	" 12	6,000
Brandy creek	Winfield & Hinton	Frank J. Rosseau	" 12	2,500
Bushley creek	Cato & Winfield	S. J. Youngman	" 12	6,000
Riches creek	Cato & Belvidere	" "	" 12	6,000
West branch of Flat river	Pine	" "	" 12	2,000
Horse Shoe Lake creek	Belvidere	" "	" 12	2,500
Stream on Secs. 21, 28 and 27	Pine	" "	" 12	2,500
Irving creek	"	" "	" 12	5,000
Wiley creek	Cato, Pine & Douglas	" "	" 12	8,000
West branch of Flat river	Pine & Montcalm	" "	" 12	8,000
Lahar creek	Home	W. R. Jones	" 12	8,000
Giger creek	"	" "	" 12	7,000
Sacketts creek	"	" "	" 12	2,000
Kirby creek	"	" "	" 12	2,000
Two east br. of Cedar creek	Day	James McCrea	" 12	8,000
Tamarack creek	Winfield and Cato	J. K. V. Agnew	" 12	15,000
Castle creek	Bushnell	H. E. Howarth	" 12	4,000
Stoney creek	Sidney	F. H. French	" 12	2,500
Dickerson creek	"	C. Ellis Elliott	" 12	6,000
West branch of Fish creek	" and Douglas.	" "	" 12	2,000
Sucker creek	Pine and Douglas	" "	" 12	4,000
Spring creek	Pine	" "	" 12	4,000
Lucas creek	Douglas	" "	" 12	4,000
Reed creek	Day	G. T. Howarth	" 12	2,000
Willet creek	Evergreen	" "	" 12	4,000
Branch of Fish creek	Sidney	S. Benj. Young	" 12	2,000
Horse Shoe creek	Montcalm	T. I. Phelps	February 20	2,500
Spring creek	Maple Valley	Sid V. Bullock	" 20	2,000
Cedar creek	Winfield	" "	" 19	3,000
Church creek	"	S. C. Scott	" 19	4,000

Brook Trout Plants, 1895.—CONTINUED.

County and name of waters.	Township.	Depositor.	Date.	Number.
Montcalm—*Continued:*				
Handy creek	Reynolds, Winfield and Cato	S. C. Scott	February 19	8,000
Rice creek	Pierson and Reynolds	" "	" 19	2,000
Salt Springs creek	Eureka	T. I. Phelps	" 20	2,500
Clifford creek	Montcalm	" "	" 20	2,500
Spring creek	Eureka	" "	" 20	2,500
Wilcox creek	"	" "	" 20	2,500
Spring brook	Day and Ferris	S. Frost	March 12	3,000
Tamarack river	Reynolds	W. B. Stimson	" 25	10,000
Muskegon:				
Silver creek Thomas creek Flower creek	Whitehall	E. M. Ruggles	" 14	4,000
Rudiman creek	Muskegon	James Pitt	" 14	2,500
Little Bear creek Big bear creek Black creek Green creek	"	E. D. Magoon	" 14	7,500
Powers creek	Norton & Fruitport	" "	" 14	2,500
Little Black creek	" Muskegon	" "	" 14	2,500
Crookery creek	Ravenna	E. Bartholemew	" 14	2,500
Titatute creek	"	" "	" 14	2,000
Gulley's brook	"	Miles M. Brafford	" 14	3,000
Newaygo:				
Bigelow creek	Brooks	S. D. Thompson	" 14	12,000
Tennewait creek	Croton	" "	" 14	8,000
Thompson creek	Everett	" "	" 14	3,000
Penoyer creek	Garfield	J. K. V. Agnew	" 14	5,000
Williams creek	Garfield & Sheridan	" "	" 14	8,000
Brooks creek	Brooks	W. H. Kritzer	" 14	3,000
Bigelow creek		Edwin O. Shaw	" 14	6,000
Jim Wright creek	Denver	James Stannard	" 14	1,500
Harrington or Heald creek	"	Andrew Gerber	" 14	5,000
Williams creek	Sheridan	" "	" 14	8,000
Pickerel creek	Troy	Chester Brown	" 14	5,000
Cedar creek	"	T. A. Harvey	" 14	3,000
Oakland:				
Shiawassee river	Springfield	F G. Ely	" 8	4,000
Shadbolt creek	Orion and Oakland	Simeon Grube	" 9	4,000
Paint creek	Orion, Oakl'd & Avon	" "	" 9	5,000
Oceana:				
Shigley creek	Hart	E. D. Richmond	" 14	3,000
Russell creek	"	" "	" 14	3,000
Lembrix creek	Golden	" "	" 14	8,000
South br. of Pentwater creek	Elbridge, Hart and Weare	" "	" 14	8,000
Gunnix creek	Elbridge	" "	" 14	3,000
Ogemaw:				
Brooks creek	Rose	Hiram Hodge	April 2	3,000
Wilkins creek	Klacking & Cumming	" "	" 2	3,000
Stream on Sec. 13 Forest Home stream	Edwards & Ogemaw " "	G. N. Hauptman	March 22	12,000
Stream on Sec. 12	Edwards	" "	" 22	2,500
Rifle river	Ogemaw	R. H. L'Hommedieu	" 22	12,000
Tittabawassee river	2 N., R. 12	" "	" 22	24,000
Ontonagon:				
Little Cranberry creek	Ontonagon	W. F. Sawyer	May 25	1,000
Union creek	Carp Lake	" "	" 25	1,000
Osceola:				
Narraway creek Dock and Tom creeks Hicks creek	Hartwick and Sylvan	J. J. Reik	April 1	2,000
Sweets creek	Richmond	Edwin Wood	" 1	4,000
Rattail creek	Orient	F. T. Jeff	" 1	5,000
Benjamin creek	"	" "	" 1	5,000
Sandy creek	"	" "	" 1	5,000
Town Line creek	"	W. B. Stimson	March 28	9,000
Snyder's creek	"	" "	" 28	2,000
Ghost creek	Marion	D. O. Fry	" 28	3,000
Pine river	Bardell	W. B. Stimson	" 28	5,000

Brook Trout Plants, 1895.—CONCLUDED.

County and name of waters.	Township.	Depositor.	Date.	Number.
Otsego:				
East branch of Sturgeon	Corwith	Jas. W. Turner	March 22	5,000
Boyne river	Elmira	W. B. Stimson	" 28	12,000
Mossback creek	Dover & Livingston	John D. Porter	" 22	9,000
Brown creek				
Leslie's creek				
Headwaters of Sturgeon river	Livingston	R. H. L'Hommedieu	" 22	15,000
Pigeon river	Dover	Fred Barker	" 22	8,000
Black river				
West branch of Sturgeon river	32 N., 3 W.	R. H. L'Hommedieu	" 22	15,000
Pigeon river and branches	Dover	A. A. Crane	" 22	12,000
Ottawa:				
Yonker's creek	Holland	Arthur Baumgartel	February 26	2,000
Pine creek	"	J. A. Van Dyke	" 26	2,000
Pigeon creek	Grand Haven	Frank Myers	March 14	4,000
Robinson creek	Robinson	Frank S. Wilson	" 14	4,000
Wild's creek	Spring Lake	" "	" 14	1,000
Roscommon:				
Sugar creek	Nester	R. H. L'Hommedieu	" 22	15,000
Sanilac:				
Mill's creek	Worth	Rudolph Pabst	" 8	3,000
Ellis creek	Lexington	John W. Norman	" 8	4,000
Shiawassee:				
Coon creek	Sciota, Middleburg & Ovid	James A. Valentine	" 12	4,000
Alder creek				
St. Clair:				
Silver creek	Greenwood	Paul Willey	" 8	4,000
St. Joseph:				
Pebble brook	Nottawa	L. A. Clapp	" 5	2,500
Rocky river	Lakeport & Flowerfield	H. H. Whipple	" 5	9,000
Portage river	Lakeport & Park	" "	" 5	9,000
Stream on Secs. 21, 22 and 28	Summit	Frank Kenyon	February 28	3,000
Tuscola:				
Cass river	Indian Fields & Almer	Charles Montague	April 9	5,000
White creek	Ellington			
Dead creek	Arbela	H. D. Hinkley	" 5	5,000
Van Buren:				
Ackley creek	Antwerp	Lincoln H. Titus	March 5	3,000
Willow creek	"	B. W. Payne	" 26	4,000
Hayden creek	Almena	George Langdon	" 26	5,000
Crystal Spring creek	Porter	C. F. Dey	" 26	3,000
Headquarters of the Paw Paw river	Antwerp	" "	" 26	4,000
Spice Bush creek	Geneva	John C. Merson	" 25	4,000
Three Mile creek	Bangor & Geneva	Wm. Broadwell, Jr.	" 25	2,000
Iron Run creek	Paw Paw	C. Engle	" 26	2,500
Anderson creek	Decatur	Frank Stapleton	" 26	2,500
Brush creek	Hamilton	" "	" 26	5,000
Watkins creek	Geneva	C. D. Stewart	" 25	2,000
Washtenaw:				
Lett's creek	Sylvan	C. E. Letts	February 14	5,000
Not named	Pittsfield & York	Geo. W. Walterhouse	" 14	2,000
Paint creek	Ypsilanti & Augusta	" "	" 14	2,000
Fleming creek	Superior & Saline	" "	" 14	2,500
Townsend creek	Ann Arbor	Emory Townsend	" 14	6,000
Fleming creek	" "	Fred R. Rice	" 14	5,000
Wexford:				
Bock creek	Springville	T. Gale	March 18	3,000
Fletcher creek	"	" "	" 18	3,000
Fresh Water creek	Wexford	" "	" 18	3,000
Railroad creek	Slagle	James Z. Stanley	" 19	4,000
Slagle creek	Boon	" "	" 19	5,000
Bear creek	Slagle	" "	" 19	4,000
Slagle creek	Harrietta & Boon	C. Stein	" 19	4,000
Newton's creek	Hanover	" "	" 19	4,000
Churchill creek	Springville	" "	" 19	2,000
Fletcher creek	Antioch	" "	" 19	4,000
Cedar creek	Cedar Creek	W. B. Stimson	" 19	12,000
Total				2,305,000

Brook Trout Plants, 1896.

County and name of waters.	Township.	Depositor.	Date.	Number.
Alcona:				
Duval creek	Mikado	C. W. Luce	March 10	10,000
South branch of Pine river	Curtis	W. M. Featherly	" 10	20,000
Pine river	Gustin & Mikado	Charles Conklin	" 10	10,000
Vannettan creek	Harrisville & Mikado	" "	" 10	10,000
Buff Brown creek	Hawes	" "	" 10	6,000
Black river	Harrisville, Haynes & Alcona	" "	" 10	10,000
Sucker creek	Hawes	" "	" 10	10,000
Middle branch of Pine river	Mikado	" "	" 10	6,000
Mill creek	Harrisville	L. A. Colwell	" 10	5,000
East branch of Pine river	Gustin	B. Anger	" 10	15,000
Allegan:				
Barnes creek	Otsego	C. Engel	February 10	3,000
Spencer creek	"	A. A. Mansfield	" 10	3,000
Blackman creek	Trowbridge	" "	" 10	3,000
Mitchell creek	Adams & Otsego	Conrad Bros.	" 10	10,000
Butternut creek	Otsego	Sherwood Bros.	" 10	3,000
Burch creek	Alamo	C. R. Rathbun	" 10	6,000
Rose creek	Otsego	Fred Tubbs	" 10	3,000
Franklin creek	Otsego & Alamo	A. D. Baker	" 10	6,000
Pine creek	" " "	G. E. Barden	" 10	9,000
Clear Lake outlet	Trowbridge	Geo. D. Higgins	" 10	3,000
Deyo's creek	Otsego	John N. Perkins	" 10	3,000
Yerrick's creek	Otsego & Gun Plains	Chas. W. Edsell	" 10	6,000
Plummerville creek	Ganges	J. M. Link	" 5	3,000
Spectacle brook	Monterey	Edwy C. Reid	" 13	3,000
Bear creek	Monterey & Heath	" "	" 13	6,000
Mill creek	Monterey	" "	" 13	3,000
Clifford creek	Trowbridge	" "	" 13	3,000
Sand creek	Pine Plains	" "	" 13	3,000
Doud's creek	Heath	" "	" 10	6,000
Sink brook	"	" "	" 13	3,000
George's Run	Trowbridge	" "	" 13	3,000
Town Line creek	Pine Plains	LaFayette Stuch	" 13	6,000
Little Rabbit river	Dorr	John C. Newman	" 13	9,000
Page brook Miller brook	Martin	John Burgess	" 10	3,000
Rabbit river	Wayland	John A. Turner	" 10	10,000
Grigg brook	Wayland & Martin	" "	" 10	6,000
Abram's creek Travis creek	Alamo	Ed. J. Anderson	" 10	6,000
Silver creek Seely's creek Brown creek Duncan creek	"	" "	" 10	6,000
Delano creek Brown's creek	"	" "	" 10	10,000
Alpena:				
Stream on Secs. 31, 32, 33 and 26, and Secs. 3, 11 and 13	Towns 31 and 32	Alex. Cannon, Jr.	March 10	9,000
Antrim:				
Stream on Secs. 6 and 7	Star & Chestonia	Edwin E. Mills	" 5	6,000
Racket creek	Chestonia	" "	" 5	6,000
Cascade creek	"	" "	" 5	6,000
St. Mary's creek	Star & Chestonia	" "	" 5	3,000
Hillman's creek	Banks	C. S. Campbell	February 27	3,000
Orr creek	"	W. J. Crego	" 27	3,000
Dwyer creek	"	Jeff Bearrs	" 27	1,000
Boss creek	"	" "	" 27	3,000
Wilson creek	"	" "	" 27	1,000
Cedar river and branches	Kearner & Custer	O. W. Kibby	" 27	15,000
Cold creek	" " "	" "	" 27	3,000
Crampton creek Wiltse creek Burdick creek Mohrman creek	Central Lake	Chas. E. Ramsey	" 27	9,000
Ogleton creek	" "	O. P. Barber	" 27	6,000

Brook Trout Plants, 1896.—CONTINUED.

County and name of waters.	Township.	Depositor.	Date.	Number.
Baraga:				
Slate river	Avon	N. S. Pennock	May 12	5,000
Ravine river	“	“ “	“ 12	9,000
Silver river	Baraga	“ “	“ 12	10,000
Ogema creek	L'Anse	“ “	“ 12	5,000
Pine creek	Baraga	“ “	“ 12	6,000
Carp creek	“	“ “	“ 12	6,000
Sturgeon river		C. D. Sheldon	“ 25	16,000
Barry:				
Ream's creek	Hastings	F. H. Barlow	February 13	3,000
Pine Gulley creek	Baltimore	Charles Prichard	“ 13	3,000
Leonard's creek	Irving	Luther S. Mills	“ 13	1,000
Glass creek	“	“ “	“ 13	3,000
Silver creek	Yankee Springs	“ “	“ 13	1,000
Hill creek	Hastings	Jacob H. Neiss	“ 13	3,000
Mitchell creek	Irving	“ “	“ 13	3,000
Stream on Sec. 34	Carlton	R. K. Grant	“ 13	1,000
Orr creek	Irving	J. M. McElwain	“ 13	3,000
Mill creek	Carlton	“ “	“ 13	2,000
No name	Rutland	“ “	“ 13	3,000
Pratt creek	Hastings	A. J. Sponable	“ 13	3,000
Stream on Sec. 5	“	“ “	“ 13	3,000
Glass creek	Rutland	E. G. Holbrook	“ 13	3,000
Mangham creek	Baltimore	W. H. Spence	“ 13	3,000
Erb creek	Hastings	Edward Schumman	“ 13	3,000
Kada creek	Rutland	S. A. Crowell	“ 13	3,000
Cherry creek	Hastings	“ “	“ 13	3,000
Stream on Sec. 31	Burlington	Edgar Fisher	“ 13	2,000
High Bank creek	Baltimore	Isaac Powell	“ 13	6,000
Griffin creek	Rutland	P. T. Colgrove	“ 13	3,000
Heney branch of West creek	“	“ “	“ 13	3,000
Kenfield creek	Hastings	“ “	“ 13	3,000
Murphy creek	Hope	A. L. Campbell	“ 13	3,000
Stream on Secs. 35 and 36	“	W. J. Lance	“ 13	3,000
Polly creek	Barry	Calvin Stanton	“ 13	1,000
Britten creek	“	“ “	“ 13	2,000
Cox creek	Hope	A. Cox	“ 13	3,000
Bostwick creek	Barry	C. W. Collins	“ 13	3,000
Big Spring brook	“	Jett Letts	“ 13	1,000
Quaker brook	Maple Grove	Taylor Walker	“ 13	6,000
Mill brook	“ “	A. Halfner	“ 13	6,000
Salisbury creek	Orangeville	Eli Nichols	“ 10	3,000
Not named	“	“ “		3,000
Benzie:				
Clay creek	Inland & Homestead	J. K. V. Agnew	February 27	8,000
Platte river	Homestead	W. H. Bennett	April 17	10,000
Aux Bec Sciss river	Weldon		“ 17	15,000
Little Betsey river	Thompsonville	C. Stein	“ 17	9,000
Crystal creek	Benzonia	“ “	“ 17	3,000
Sherman creek	Inland and Almira	W. H. Schroeder	March 13	6,000
Platte river	“ “ “	“ “	“ 13	10,000
Ransom pond and creek	Almira	“ “	“ 13	3,000
Berrien:				
Brandywine creek	Niles	Geo. W. Dougan	February 11	3,000
Zearning's creek	Galien	D. F. Bommerscheim	“ 6	3,000
Warren's creek	Chickaming	“ “	“ 6	1,000
Estes brook	Buchanan	L. L. Redden	“ 6	1,000
Lore creek Lennox creek Penterbaugh creek	Berrien	Henry Frank	“ 6	6,000
Lemon creek	Oronoko	George Whitman	“ 6	6,000
Farmer's creek	Pipestone and Sodus	E. E. Plimpton	“ 5	3,000
Hog or Putnam creek	Sodus and Benton	“ “	“ 5	3,000
Sand creek	Benton	“ “	“ 5	6,000
Mill creek	Watervliet	H. E. Morrell	“ 5	10,000
Blue creek	Bainbridge & Benton	D. J. Morrison	“ 5	9,000
Branch:				
Riley's creek	Sherwood	W. H. Hubbard	“ 6	3,000
Miller's Spring brook	Kinderhook	Clayton C. Johnson	March 3	2,000
Stream on Sec. 2	“	Albert J. Dorrance	“ 3	1,000
Shinneman's creek	Batavia	Henry H. Barlow	“ 3	2,000
Sherman's creek	Coldwater	“ “	“ 3	3,000

Brook Trout Plants, 1896.—CONTINUED.

County and name of waters.	Township.	Depositor.	Date.	Number.
Calhoun:				
Lenhart's brook	Marshall	J. F. Garwood	February 13	3,000
Pigeon brook	"	" "	" 13	3,000
Pigeon creek	Eckford	" "	" 13	3,000
Hubbard's creek	Marshall	" "	" 13	3,000
Loomis creek	Eckford	" "	" 13	5,000
Pall brook	Battle Creek	Geo. S. Perry	" 13	3,000
Eldred creek	Tekonsha	A. D. Eldred	" 6	6,000
Holmes brook	Athens	Geo. Buchanan	" 6	3,000
Nottawa creek	"	Ira Warsop	" 6	10,000
Buchanan brook	Burlington	" "	" 6	3,000
Thomson's creek	Athens	Joseph Beadle	" 6	6,000
Harsh creek	Burlington	Cyrenius B. Knight	" 6	3,000
Cass:				
Smith's creek	Jefferson & Howard	C. H. Kimmerle	" 6	6,000
Jones creek	La Grange	" "	" 6	3,000
Stream on Secs. 24 and 25	Jefferson	Edward Kegan	" 6	5,000
Stream on Secs. 27, 28 and 33	La Grange	A. M. Kingsbury	" 6	3,000
Wither's creek	Porter	J. Withers	" 6	10,000
Motley's run	"	Geo. E. Everding	" 6	1,000
Stream on Secs. 30, 31, 32 and 33	Newberg	Chas. Wetherbee	" 6	1,000
Dowagiac creek	Volinia	C. S. Jones	March 3	6,000
Spring brook	Newberg	" "	" 3	1,000
Big creek	Marcellus	W. L. Arnold	" 3	6,000
Cobert creek Brandywine creek	Jefferson and Melton	J. A. Parsons	" 3	3,000
Conklin creek	Marcellus	E. P. McKenzie	" 3	3,000
Mechanicsburg creek	La Grange	A. B. Atwater	" 3	6,000
Charlevoix:				
Spring brook br. of Bear creek	Melrose	W. B. Stimson	April 4	10,000
St. Clair creek	South Arm	C. S. Campbell	February 27	3,000
Monroe creek	" "	L. D. Bartholemew	" 27	10,000
Cheboygan:				
Little Pigeon river	Nunda	Jacob K. Shook	March 6	10,000
Spring brook	Burt	Wm. Hawkins	" 6	3,000
Little Sturgeon river	34 and 35 N., 2 W.	M. A. McHenry	" 6	10,000
Stewart creek	33 N., 2 W.	R. H. L'Hommedieu	" 21	12,000
Chippewa:				
East br. of Tahquamenon river	46 N., 7 W.	Mich. Fish Com.	May 8	13,000
Trout brook	Rudyard	John H. D. Everett	" 6	4,000
Bear creek	"	" "	" 6	4,000
Trout brook	"	H. H. Wyatt	" 6	7,000
Sault Rapids		Mich. Fish Com.	April 10 to June 29	216,000
Clare:				
Randall creek	Grant	O. S. Derby	February 17	3,000
Becker creek	"	" "	" 17	3,000
Chard creek	"	" "	" 17	6,000
Waldo creek	"	" "	" 17	3,000
Hay creek	"	" "	" 17	3,000
Beaver creek	"	" "	" 17	6,000
Utley creek Wagner creek	Surrey	Nat D. Watkins	" 17	6,000
No name	"	" "	" 17	3,000
Newton creek	"	E. H. Smith	" 17	3,000
Several streams on Secs. 8, 9, 16, 20 and 32	17 N., 4 W.	Geo. M. Brown	March 20	6,000
Silver creek	17 N., 6 W.	" "	" 20	6,000
Norway creek	Temple	C. Stein	April 17	6,000
Gishawash creek	"	" "	" 17	6,000
Clinton:				
Coon creek	Middleburg & Siota	J. A. Valentine	February 21	6,000
Little Maple river	Ovid	F. D. Cleveland	" 21	5,000
Alder creek	Ovid and Victor	Chas. Cowan	" 21	3,000
Meadow brook	Eagle	Frank O. Bryan	" 18	3,000
Crawford:				
North branch of Au Sable	28 N., 1 W.	R. H. L'Hommedieu	March 21	18,000
East " " "	27 N., 3 W.	" "	" 21	15,000
Br. of south br. of Au Sable	Center Plains	" "	" 21	15,000
East br. of east br. of Au Sable	Grayling	A. E. Newman	" 6	10,000

Brook Trout Plants, 1896.—CONTINUED.

County and name of waters.	Township.	Depositor.	Date.	Number.
Delta:				
Day's river	Masonville and Baldwin	Richard H. Mertz	May 6	6,000
Dickinson:				
Stream on Secs. 6, 41 and 27	Breen	S. H. Bridges	" 15	9,000
Davis creek	Breen and others	" "	" 15	6,000
Eaton:				
Mill creek	Walton and Lee	Samuel Curtis	February 21	10,000
Town Line brook	Walton and Carmel	E. R. Moran	" 21	5,000
Boyer brook	Chester	F. S. Jordan	" 13	3,000
Roll brook	"	" "	" 13	3,000
Jennie or Beeman brook	"	" "	" 13	3,000
Hanes creek	Vermontville	" "	" 13	3,000
Jordan brook	Chester	" "	" 13	3,000
Emmet:				
Bear river	Clarion	W. B. Stimson	April 4	10,000
Maple river	Pellston	" "	" 4	16,000
Genesee:				
Begole's creek	Genesee	C. M. Begole	February 18	6,000
Gladwin:				
Chapman creek	Edward and Clement	Geo. L. Lamb	March 6	6,000
Gogebic:				
McDonald river	Bessemer	L. L. Wright	May 7	10,000
Siemers creek	Ironwood & Bessemer	" "	" 7	8,000
Welch creek	Ironwood	" "	" 7	6,000
Not named	"	" "	" 7	6,000
Hammond's creek	"	" "	" 7	6,000
Montreal river	"	" "	" 7	6,000
Black river	Bessemer	" "	" 7	4,000
Little Presque Isle river	Wakefield	" "	" 7	10,000
East branch of Little Presque Isle river	Marenisco	" "	" 7	4,000
Stream on Secs. 9, 16 and 17	46 N., 43 W.	" "	" 7	2,000
Little Presque Isle river	Marenisco	" "	" 7	6,000
Duck creek	Watersmeet	" "	" 7	4,000
Ontonagon river	"	" "	" 7	4,000
Trout brook	Marenisco	J. M. Whitman	" 7	2,000
Slate river	"	" "	" 7	7,000
Trout brook	"	Henry B. Roney	" 7	6,000
Pelton brook	"	" "	" 7	2,000
Powder Mill creek	Bessemer	Thos. Kissane	" 7	4,000
No name on fract. Secs. 8 and 9	Ironwood	" "	" 7	4,000
Welch creek	"	L. C. Walker	" 7	2,000
Duck creek	Watersmeet	A. D. Johnston	" 7	4,000
Ontonagon river	"	" "	" 7	4,000
Black river	Bessemer	L. L. Wright	" 7	14,000
Montreal river	Ironwood & Bessemer	" "	" 7	14,000
Grand Traverse:				
Beitner creek	Blair	J. K. V. Agnew	February 27	6,000
Boardman river		L. L. Lydell	" 27	20,000
Mill creek Keiser's creek		" "	" 27	3,000
Fairbank creek	Whitewater	" "	" 27	3,000
East creek	Paradise	J. O. Crotser	March 13	6,000
Mayfield creek	"	" "	" 13	6,000
Gratiot:				
Adams creek	Arcada, Seville and Sumner	Birton I. Gee	" 10	6,000
Bullock creek	Sumner	" "	" 10	3,000
Hillsdale:				
Wheatland creek	Wheatland	James B. Thorne	" 3	3,000
Silver creek	Cambria and Woodbridge	Ed. D. Babcock	February 13	3,000
Stream on Secs. 14 and 23	Camden	W. C. Young	" 13	3,000
Stream on Secs. 11, 12, 36, 26, 22, 23 and 17	Reading and Allen	Chas. F. Niblack	" 13	6,000
Hodges creek	Scipio	T. J. Strait	" 13	3,000
Townsend Spring brook	Moscow and Hanover	Eugene Strait	" 13	3,000

Brook Trout Plants, 1896.—Continued.

County and name of waters.	Township.	Depositor.	Date.	Number.
Houghton:				
Otter creek and branches	Portage and Chassell	C. D. Sheldon	May 25	30,000
Salmon Trout river	Portage	" "	" 25	14,000
Martin creek	Calumet	A. Martin	" 12	3,000
Hill's creek	Houghton & Keweenaw	Wm. H. Ellis	" 12	6,000
Bad Water creek	Duncan	G. W. Shane	" 12	3,000
Shane creek	"	" "	" 12	6,000
Blackman creek	"	" "	" 12	6,000
Sidnaw creek	47 N., 35 W.	Geo. H Houser	" 12	6,000
Breauno river	Laird	Leonard Gillispie	" 12	6,000
Branch of west branch of Sturgeon river	"	" "	" 12	9,000
Huron:				
Willow Spring brook	Verona	J. B. Madill	March 17	6,000
Ionia:				
Seeley's creek	Otisco and Grattan	G. O. Bignell	February 15	10,000
Stocking's creek and Cannon's Mill pond	Otisco	H. J. Leonard	" 15	3,000
Froyer creek Silver creek McVeigh creek	Lyons	Fremont C Hathaway	" 21	10,000
West creek	"	Albert Roof	" 21	3,000
Erret creek	"	" "	" 21	3,000
Stone Quarry creek	"	" "	" 21	3,000
Knapp creek	"	" "	" 21	3,000
Struble creek	Lyons and No. Plains	" "	" 21	3,000
Brown creek	Lyons	" "	" 21	3,000
Ronald creek	Ronald	H. L. Bailey	" 21	6,000
Iosco:				
Sim's creek	Tawas and Baldwin	C. W. Luce	March 10	6,000
East branch of Au Gres river	Plainfield, Grant and Sherman	" "	" 10	20,000
Gailey creek	Plainfield	" "	" 10	10,000
Smith's creek	Plainfield, Grant and Sherman	" "	" 10	10,000
Indian creek	Oscoda	John Tadgahsong	" 10	10,000
Iron:				
West branch of Jumbo river	46 N., 37 W.	G. W. Shane	May 12	6,000
Jumbo river	" "	" "	" 12	6,000
Isabella:				
Skunk creek	Rolland	W. R. Jones	February 15	15,000
" "	"	J. K. V. Agnew	" 13	10,000
Pumphrey creek	"	" "	" 15	5,000
Hersey creek	Wise	E. W. Allen	" 17	6,000
Loomis creek	"	" "	" 17	6,000
Willey creek	"	" "	" 17	6,000
Stoney brook	Deerfield	Geo. A. Hicks	March 10	3,000
Chippewa Cedar creek	"	" "	" 10	6,000
Darrough creek	Union	" "	" 10	6,000
Camfro creek	Deerfield	" "	" 10	3,000
Wheelan's creek	Union	Geo. A. Chatterton	" 10	6,000
Jackson:				
Cleland stream	Hanover	W. W. Dew	February 13	3,000
Mackey brook	Rives	Grove H. Wolcott	" 13	3,000
Tributary to Grand river	Liberty	C. J. Van Schoick	" 13	3,000
Wheaton spring	Hanover	E. L. Heath	" 13	2,000
Kalamazoo:				
Eagle or Streator creek	Charleston and Ross.	Henry D. Streator	" 13	5,000
Hinton creek	Ross	H. Dalo Adams	" 13	6,000
Little Portage creek	Texas & Kalamazoo	A. J. Stevens	" 10	3,000
No name		A. L. Lakey	" 10	3,000
Asylum brooks	Kalamazoo	Henry Ostrander	" 10	3,000
Harrison's creek	Schoolcraft	W. C. Kohl	March 3	1,000
Wells creek	"	" "	" 3	1,000
Little Portage creek	Wakeshma	C. S. Hasbrouck	" 3	6,000
Terry creek	Prairie Ronde	John Terry	" 3	6,000
Klein creek	Flowerfield	Chas. W. D. Allen	" 3	6,000
Chamberlain creek	Prairie Ronde	John E. Pabst	" 3	6,000
Bly creek	" "	Henry I. Allen	" 3	6,000
Stanley creek	Portage	Joseph Conklin	" 3	1,000

Brook Trout Plants, 1896.—Continued.

County and name of waters.	Township.	Depositor.	Date.	Number.
Kalkaska:				
Rapid river	Clearwater, Kalkaska and Excelsior	Elmer E. Wealch	February 27	10,000
South Boardman river	Boardman	W. B. Stimson	April 4	10,000
Middle Boardman river	"	" "	" 4	10,000
Rapid river	Rapid River	" "	" 4	25,000
Kent:				
Hutchins creek	Algoma & Plainfield	Robert Carlyle	February 10	2,000
Barclay creek Leache creek	Cannon & Plainfield	" "	" 10	3,000
Turner creek	Algoma	" "	" 10	2,000
Keweenaw:				
Montreal river		W. T. Ellis	May 25	26,000
Silver creek	Allouez	" "	" 12	6,000
Gratiot river	"	Charles Schmick	" 12	1,000
Tobacco river	Sherman	Morgan Williams	" 12	10,000
Lake:				
Streams on Secs. 10, 11 and 12	Centre	J. K. V. Agnew	February 27	6,000
Roach creek	"	" "	" 27	6,000
Irons creek	Eden and Elk	" "	" 27	12,000
Little Danaher creek	Plains	" "	" 27	5,000
Sauble river	Sheridan and Elk	H. W. Marsh	March 23	15,000
Little Manistee river	19 N., 13 W.	Geo. M. Brown	" 23	15,000
North branch	19, 20 N., 12 W.	" "	" 23	6,000
Little Manistee river	Ellsworth	W. B. Stimson	April 4	15,000
N. br. of Pere Marquette river	Nirvana	Mich. Fish Com.	" 13	10,000
Lapeer:				
Hasly creek	Elba and Oregon	L. J. Wicker	February 18	9,000
Elk creek	Marathon	J. L. Preston	" 18	6,000
North branch of Flint river	Rich	" "	" 18	10,000
Smith's creek	Deerfield	" "	" 18	6,000
Dutch creek	Oregon	Hiram Jones	" 18	3,000
Brocker creek	Hadley	M. F. Hemingway	" 18	3,000
Webster creek	"	" "	" 18	6,000
Hemingway creek	"	" "	" 18	3,000
Farmer's creek	Metamora	R. B. Conklin	" 18	10,000
Branch of Hunter's creek	Lapeer	C. A. Smith	" 18	3,000
Gravel creek	North Branch	Jephtha Bradshaw	April 6	9,000
Leelanau:				
Mosseau's creek	Leelanau	Omena Hotel Assoc.	March 13	6,000
Stream and pond on Secs. 4, 32, 4, 31	"	N. E. De Golier	" 13	6,000
Crystal river	Glen Arbor	D. H. Day	" 13	6,000
Cedar creek	Solon	N. W. Herrington	" 13	6,000
Singery creek Everett's creek Clear creek	"	" "	" 13	6,000
Wells creek	Kasson	N. W. Courson	" 13	1,000
Knox creek	Empire	E. R. Dailey	" 13	1,000
Lenawee:				
Woodward creek	Franklin	H. H. Holladay	" 3	3,000
Evans creek	Franklin & Tecumseh	M. J. Pierce	" 3	8,000
Lawrence creek	Hudson	James B. Thorn	" 3	3,000
Luce:				
Stream on Secs. 26, 5, 8, 17, 16 and 21	Columbus	W. L. Lake	May 11	6,000
Macomb:				
McKay's creek	Bruce	H. W. Bradley	February 18	6,000
Mackinac:				
Coleman creek	Garfield	Wm. Hudson	May 6	2,000
Cool creek	"	" "	" 6	2,000
Stevens creek	Newton	E. A. Davis	" 6	2,000
Outlet of S. Manistique lake	"	" "	" 6	2,000
Manistee:				
Little Bear creek	Springdale	J. K. V. Agnew	February 27	6,000
Pine creek	Stronach	" "	" 27	10,000
Corfu creek	Brown	" "	" 27	4,009

Brook Trout Plants, 1896.—Continued.

County and name of waters.	Township.	Depositor.	Date.	Number.
Manistee—*Continued:*				
Conger Creek	Maple Grove	J. K. V. Agnew	February 27	10,000
Knickerbock creek Gilson creek	Maple Gr've & Marilla	M. S. Howes	March 13	10,000
John P. Mason creek	Onekema	Hans Hansen	" 13	6,000
Secor's creek	Manistee	Thomas H. Peterson	" 20	3,000
Clay Bank creek	East Lake	T. A. Brown	" 20	9,000
Kill or Kinne creek	Brownstown	C. Stein	April 17	2,000
Marquette:				
Little Falls creek	Republic	Peter Pascoe	May 12	6,000
Second river	Ely & Humboldt	W. L. Bedford	" 12	6.000
North branch of west branch of Escanaba river	Tilden & Palmer	Geo. A. Newett	" 12	9,000
Cook's creek	Ishpeming	" "	" 12	3,000
Switzer's creek	Richm'd & Negaunee	John Q. Adams	" 12	10,000
Mason:				
Nickerson creek	Summit	D. C. Wickham	February 24	6,000
Quinn creek	Summit & Riverton	" "	" 24	6,000
Lincoln creek	19 N., 15 W.	Geo. M. Brown	March 23	6,000
Big Sable creek	20 N., 15 W.	Wm. H. Baldwin, Jr.	" 23	15,000
Mecosta:				
Black creek	Millbrook	J. K. V. Agnew	February 15	6,000
Bamber brook	Sheridan	" "	" 15	5,000
Randy branch	Martiny & Chippewa	" "	" 15	12,000
Hughes creek	Martiny	" "	" 15	7,000
Pointer creek	Wheatland & Norton	" "	" 15	4,000
Little Chippewa river	Sheridan	" "	" 15	8,000
Randy branch	Chippewa	James A. Roof	" 15	3,000
Stream on Secs. 20 and 17	"	" "	" 15	2,000
Cedar creek	Grant	" "	" 15	6,000
Gill creek	Deerfield	Fred C. Boyd	March 2	6,000
Quigley creek	"	" "	" 2	10,000
Stony creek	"	" "	" 2	6,000
Mack's creek		Wm. B. Stimson	April 9	7,000
Little Muskegon river	Deerfield	" "	" 9	15,000
Borland creek	Ætna	" "	" 9	10,000
Paris creek	Green	L. S. Sniger	" 9	15,000
Midland:				
Pine river	Homer, Porter and others	Wm. Booth	" 6	25,000
Missaukee:				
Clane creek	Lucas	D. B. Kelley	March 12	20,000
Montmorency:				
Brush creek	Montmorency	James Hubert	" 11	15,000
Montcalm:				
Corb[illegible]n creek		Birton I. Gee	" 10	6,000
Town Line Lake creek	Belvidere	J. K. V. Agnew	February 15	8,000
Tamarack creek	Winfield and Cato	" "	" 15	20,000
Brand creek	Winfield	Frank J. Rossman	" 15	3,000
Lahar creek	Home	W. R. Jones	" 15	10,000
Two east br. of Cedar creek	Day	Jacob McCrea	" 15	10,000
Spring creek	Day and Ferris	S. Frost	" 15	5,000
Eutrecan creek	Douglass	C. E. Elliott	" 15	6,000
Alder creek	Sidney	" "	" 15	6,000
Big Spring creek	Pine	Fred Spooner	" 15	3,000
Curtis creek	"	" "	" 15	10,000
West branch of Flat river	"	" "	" 15	6,000
" " " " "	" & Montcalm	S. J. Youngman	" 15	10,000
Irving creek	"	" "	" 15	16,000
Wiley creek	" Cato & Douglass	" "	" 15	10,000
Riches creek	Cato & Belvidere	" "	" 15	8,000
Stream on Secs. 21, 23 and 27	Pine	" "	" 15	3,000
Bushley creek	Cato & Winfield	" "	" 15	8,000
Clifford creek	Montcalm	T. I. Phelps	" 15	3,000
Wilcox creek	Eureka	" "	" 15	3,000
Spring brook	"	" "	" 15	3,000
Salt Spring brook	"	" "	" 15	3,000
Horse Shoe creek	Montcalm	" "	" 15	3,000

Brook Trout Plants, 1896.—CONTINUED.

County and name of waters.	Township.	Depositor.	Date	Number.
Muskegon:				
Stahl creek	Fruitport	Edwin C. Torrans	Feb. 24	3,000
Vincent creek	"	" " "	" 24	6,000
Mitchell creek Roswell creek	Ravenna	Miles W. Bradford	" 24	6,000
Gordon creek	Muskegon & Fruitp't	G. S. Gordon	" 24	3,000
Rudiman creek	" " "	James Pett	" 24	3,000
Big Black creek	Moreland & Eggleston	E. D. Magoon	" 24	6,000
Power's creek	Norton & Fruitport	" "	" 24	3,000
Little Black creek	Norton & Muskegon	" "	" 24	3,0 0
Big Bear creek	" " "	" "	" 24	6,000
Silver creek Thomson's creek Flower creek	Whitehall	E. M. Ruggles	" 24	5,000
Cleveland creek	Blue Lake	John Haverkate	" 24	10,000
Crockery creek and tributaries	Casnovia	Elliot T. Slocum	Mar. 17	5,000
Newaygo:				
Jim Wright creek	Denver	James Stannard	Feb. 29	3,000
Harrington or Heald creek	"	Andrew Gerber	" 29	3,000
Odell creek	Sherman & Dayton	Frank E. Cole	" 29	3,000
William's creek	Sheridan & Garfield	" " "	" 29	3,000
Cushman creek	Dayton & Greenwood	J. A. Gerber	" 29	6,000
Brook's creek	Sheridan & Bridgeton	W. D. Sargeant	" 29	10,000
Bigelow creek	Brooks	Edwin O. Shaw	Mar. 17	6,000
" "	"	S. D. Thompson	" 17	15,000
William's creek	Garfield & Sheridan	J. K. V. Agnew	" 17	8,000
Penoyer creek	" " "	" "	" 17	5,000
Mehrten's creek	Wilcox	" "	" 17	9,000
Head of Rouge river	Croton	George King	" 17	3,000
White river	Wilcox	M. D. Hayward	" 17	15,000
Lower Cold creek	Lincoln	" "	" 17	6,000
Five Mile creek	Wilcox	" "	" 17	6,000
Flinton creek	"	" "	" 17	9,000
Minnie creek	Lincoln	" "	" 17	6,000
Stream on Secs. 3, 10, 15 and 16	Wilcox	" "	" 17	6,000
Upper Cold creek	Lincoln	" "	" 17	6,000
S. br. of Pere Marquette river	Lilly	Michigan Fish Com.	April 13	25,000
Pea's creek		" " "	" 13	10,000
Grass Lake creek		" " "	" 13	5,000
Baker creek		" " "	" 13	5,000
Oakland:				
Branch of Rouge river	Bloomfield	S. Alexander	Feb. 21	6,000
Kearsley creek	Groveland	L. J. Winder	" 18	10,000
Oceana:				
Cedar creek	Crystal, Weare and Pentwater	D. C. Wickham	" 24	10,000
Annley creek	Weare	" "	" 24	3,000
Stoney creek		O. B. Estey	" 24	3,000
Flower creek		" "	" 24	3,000
Genneux creek	Elbridge	E. D. Richmond	" 24	3,000
Lennox creek	Golden	" "	" 24	3,000
Stony creek	Shelby and Benona	J. K. Flood	" 24	6,000
North branch of White river	Ferry and Leavitt	" "	" 24	10,000
S. branch of Pentwater river	Pentwater and others	" "	" 24	10,000
Russell creek	Hart	" "	" 24	3,000
N. branch of Pentwater river	Weare and Crystal	" "	" 24	15,000
Shigley creek	Hart	" "	" 24	3,000
Headwaters of north branch of White river	Newfield	Wm. Hayward	" 29	6,000
Ogemaw:				
Stream on Sec. 12	Edwards	G. A. Hauptman	Mar. 6	3,000
Stream on Sec. 13 Forest Home stream	Edwards & Ogemaw	" "	" 6	15,000
Nester Creek	Logan	John R. McDonald	" 10	10,000
Rifle river	Ogemaw	R. H. L'Hommedieu	" 21	15,000
Tittabawassee river	21 N., 1 E.	" "	" 21	20,000
Osceola:				
Sweet's creek	Richmond	Edwin Wood	Feb. 17	5,000
Isaacson creek	Richmond & Lincoln	J. W. Densmore	Mar. 23	6,000
Hersey river	Richmond	" "	" 23	15,000
Johnson's creek	"	" "	" 23	6,000
Snyder's creek	Lincoln	W. B. Stimson	April 4	6,000
Town Line creek	"	" "	" 4	6,000
East tributary of Pine river	Sherman	Charles Larson	Mar. 5	6,000

Brook Trout Plants, 1896.—CONCLUDED.

County and name of waters.	Township.	Depositor.	Date.	Number.
Osceola – *Continued:*				
Hunell creek	Harmon	Ezekiel Marsh	March 10	10,000
Armstrong creek	Mentor	Peter Cauchy	“ 10	6,000
Pine river	Burdell	W. B. Stimson	April 4	15,000
Otsego:				
Chapin's creek	Corwith	D. M. Sly	March 6	15,000
Pigeon river and branches	Dover	A. A. Crane	“ 6	15,000
Lakes on Secs. 22, 27 and 28	“	John Goslow	“ 6	3,000
Mossback creek Brown creed Leslie's creek	Dover & Livingston	John D. Foster	“ 6	10,000
East branch of Sturgeon river	Corwith	James W. Turner	“ 6	6,000
West branch of Sturgeon river	Elmira	R. H. L'Hommedieu	“ 21	15,000
Headwaters of Sturgeon river	Livingston	“ “	“ 21	15,000
Boyne river	Elmira	W. B. Stimson	April 4	12,000
Ottawa:				
Waverly brook	Holland	A. G. Baumgartel	February 5	3,000
Bertsch's creek	“	“ “	“ 5	3,000
Stream on Secs. 13, 16 and 21	Talmadge	Geo. H. Root	“ 24	3,000
Crockery creek	Chester	Robert Lange	March 17	6,000
Roscommon:				
Sugar creek	Nester	R. H. L'Hommedieu	“ 21	15,000
Schoolcraft:				
Spring creek	Germfask	Edward Menere	May 11	3,000
Mead creek	“	“ “	“ 11	6,000
Bear creek	“	“ “	“ 11	6,000
St. Joseph:				
Houston's run	Fawn River	Alex. Houston	March 2	3,000
Stream on Secs. 5, 8 and 17	“ “	Freeman L. Miller	“ 3	3,000
Spring run	Flowerfield	P. C Pursel	“ 3	3,000
Rocky river	Flowerfield & Lockport	H. H. Whipple	February 6	10,000
Portage river	Park and Lockport	“ “	“ 6	10,000
Pebble brook	Nottawa	L. A. Clapp	“ 6	3,000
Tuscola:				
Dead creek	Arbela	H. D. Hinkley	“ 18	6,000
Gooden creek	Vassar	M. Brainard	“ 18	10,000
Van Buren:				
Campbell's creek	Almena	Charles Veley	“ 11	3,000
Hale's spring brook	“	“ “	“ 11	3,000
Carter's creek	Pine Grove	A. B. Stuck	“ 10	6,000
Brush creek	Lawrence	George McFern	“ 11	10,000
East branch of Paw Paw river	Antwerp	J. W. Frie	“ 11	10,000
Willow creek	“	B. W. Payne	“ 11	5,000
Hayden creek	Almena	George Langdon	“ 11	6,000
Brush creek	Hamilton	Frank Stapleton	“ 11	6,000
Anderson creek	Decatur	“ “	“ 11	3,000
Butternut creek	Geneva	W. O. Cook & Son	“ 11	6,000
Deer Lick creek	South Haven	“ “ “	“ 11	3,000
Iron run	Paw Paw	C. Engle	“ 11	3,000
Ackley brook	Antwerp	Lincoln H. Titus	“ 11	3,000
Tributary to north branch of Paw Paw river	Paw Paw	William M. Thayer	“ 11	6,000
Washtenaw:				
Fleming's creek	Ann Arbor	Fred R Rice	“ 6	6,000
Townsend creek	“ “	Emery Townsend	“ 6	6,000
Fleming creek	Superior and Saline	Geo. W. Walterhouse	“ 6	3,000
Lett's creek	Sylvan	C. E. Letts	“ 6	6,000
Wexford:				
Fletcher creek	Antioch	C. Stein	April 17	3,000
Newton's creek	Hanover	“ “	“ 17	3,000
Churchill creek	Springville	“ “	“ 17	3,000
Slagel creek	Boon	“ “	“ 17	10,000
Cedar creek	Cedar Creek	W. B. Stimson	“ 4	12,000
Total				3,367,000

Brown Trout Plants, 1895.

County and name of waters.	Township.	Depositor.	Date.	Number.
Chippewa:				
Sault Ste. Marie river	Sault Ste. Marie	Michigan Fish Commission	April 29	5,000
Clare:				
Bear Lake	17 N., 5 W.	Geo. M. Brown	" 1	10,000
Grand Traverse:				
Boardman river	Several	L. L. Lydell	" 15	5,000
Ionia:				
Kelsey's creek and pond	Ionia	E. P. Kelsey	March 12	10,000
Kalamazoo:				
Campbell creek	Richland and Comstock	H. Dale Adams	" 4	5,000
Gunn creek	Charleston			
Whitford lake	"			
Lake:				
Twin lakes	Webber	Geo. M. Brown		15,000
Star lake	Lake	" "		20,000
Middle branch of Pere Marquette river	Yates and others	W. C. Rowley		7,000
L lake	Pleasant Plain	T. E. Borden		10,000
Bray lake	" "	" "		10,000
Crandall lake	" "	" "		10,000
Wolf lake	Center	Wm. H. Baldwin, Jr.		15,000
Macomb:				
Silver creek and tributaries Thornton lake and tributaries	Bruce & Washington	H. W. Bradley	March 8	7,500
Marquette:				
Dead river	Marquette	J. M. Longyear	May 22	10,000
Montcalm:				
Fatte lake	Eureka	T. I. Phelps	February 20	7,500
Muskegon:				
Carleton creek	Whitehall	John H. Chapman	March 14	5,000
Newaygo:				
South branch of Pere Marquette river	Several	A. B. Atwater	" 18	20,000
Oceana:				
Colfax lake	Colfax	E. D. Richmond	" 14	7,000
Ogemaw:				
Devoe lake	Cummings	A. S. Rose	April 2	5,000
Ontonagon:				
Fire Steel river	Greenland	Willis F. Sawyer	" 28	15,000
Mecosta:				
Clear lake	Colfax	Geo. A. Roof	February 19	7,000
Total				206,000

Brown Trout Plants, 1896.

County and name of waters.	Township.	Depositor.	Date.	Number.
Berrien:				
Ox creek Eastman creek	Benton and Sodus	E. E. Plimpton	April 9	3,000
Pipestone creek	Pipestone and Sodus.	" "	" 9	10,000
Gratiot:				
Adams creek	Arcada & Pine River.	Birton I. Gee	March 10	6,000
Beaver creek	Seville	" "	" 10	6,000
Hillsdale:				
Spring brook	Woodbridge	W. Whitney	February 13	3,000
Huron:				
Cass river	Sheridan	John B. Madill	March 17	10,000
Pigeon creek	"	" "	" 16	6,000
Ionia:				
Kelsey creek	Ionia	H. L. Bailey	February 21	3,000
Choater Spring brook	Liberty	R. C. Cary	" 13	3,000
Kalamazoo:				
Bear creek	Wakeshma	Wm. Fulton	March 3	6,000
Portage creek	Charleston & Climax	Barzilla Snow	" 26	10,000
Capt. Child's creek	Climax and Pavilion.	H. Dale Adams	February 13	10,000
Kent:				
Farr creek	Spencer and Oakfield	Freeman Addis	" 10	3,000
Butternut creek	Spencer	" "	" 10	5,000
Stream on Sec. 17	Cascade	Lewis M. Lester	" 10	3,000
Seder creek	Algoma	C. C. Darling	March 17	6,000
Blue lake	Oakfield	T. I. Phelps	February 15	6,000
Rush creek	Wyoming	Vernon Hooper	" 13	6,000
Lake and Mason:				
Sauble river	Sheridan and Elk	H. W. Marsh	March 23	10,000
Lenawee:				
Wolf creek	Cambridge & Adrian.	Marion A. Ladd	" 3	10,000
Macomb:				
Silver creek Smith's creek	Bruce & Washington.	H. W. Bradley	February 18	6,000
Elliot's creek	Bruce	" "	" 18	6,000
Muskegon:				
Big Black creek	Moorland and Muskegon	Ernest Eimer	" 24	10,000
Oakland:				
Paint creek and tributaries	Avon, Oakland and Orion	Simon Grube	April 6	15,000
Osceola:				
Ashton creek	Lincoln and Leroy	J. W. Densmore	March 23	10,000
Rose lake outlet	Sherman	E. R. Fernstrom	" 5	6,000
Ottawa:				
Rush creek	Blendon	Wm. Hall	February 24	3,000
St. Joseph:				
Little Portage creek	Mendon	C. L. Hasbrouck	March 3	10,000
Mill creek	Constantine	Arthur N. Culp	February 6	10,000
School creek	Flowerfield	H. H. Whipple	" 6	9,000
Hog creek	Lockport	" "	" 6	10,000
Total				220,000

Rainbow Trout Plants, 1895.

County and name of waters.	Township.	Depositor.	Date.	Number.
Crawford:				
Big creek	2 N., 1 W.	R. H. L'Hommedieu	June 16	15,000
Houghton:				
Pilgrim river	Portage and Adams	C. D. Sheldon	May 24	12,000
Lake:				
Baldwin creek	Webber	Michigan Fish Commission	June 10	5,000
Tributary to Little Manistee	Centre	J. K. V. Agnew	" 21	5,000
Mecosta:				
Cheney creek	Greene	Michigan Fish Commission	July 1	3,000
Newaygo:				
South branch of Pere Marquette river	Several	Michigan Fish Commission	June 17	15,000
Ontonagon:				
Town Line creek	Ontonagon	W. F. Sawyer	May 2	8,000
Osceola:				
East and west branches of Pere Marquette river	Several	Michigan Fish Commission	June 7	5,000
Total				68,000

Rainbow Trout Plants, 1896.

County and name of waters.	Township.	Depositor.	Date.	Number.
Crawford:				
Big creek	2 N., 1 W.	R. H. L'Hommedieu	June 3	15,000
Lake:				
Middle branch of Pere Marquette river	Nirvana	Michigan Fish Commission	" 15	5,000
Macomb and Lapeer:				
North branch of Clinton river	Bruce and Almont	H. W. Bradley	" 3	10,000
Manistee:				
Sauble river	Sheridan and Elk	H. W. Marsh	May 25	15,000
Mecosta:				
Stream on Secs. 20 and 21	Deerfield	Fred C. Boyd	June 8	5,000
Total				50,000

Wall-eyed Pike Plants, 1896.

County.	Name of waters.	Depositor.	Date.	Number.
Barry	Gilkie lake	Addison Pennock	May 15	120,000
	Stewart lake	L. M. Bugbee	" 15	120,000
	Mud lake	Dugall Campbell	" 15	120,000
	Wall lake	W. D. Hayes	" 15	120,000
	Clear lake	Frank Mattison	" 15	120,000
Berrien	Clear lake	Charles Fuller	" 11	120,000
Calhoun	Turtle lake	C. A. Zimmerman	" 13	160,000
	Lake Goguac	F. W. Deming	" 11	120,000
	Montcalm lake	James K. O'Hara	" 11	120,000
Cass	Sky-hawk lake	C. S. Jones	" 14	120,000
	Huycks lake	" "	" 14	120,000
	Fish lake	W. L. Arnold	" 14	120,000
	Hemlock lake	E. S. Mack	" 14	120,000
	Otter lake	W. B. Young	" 14	120,000
	Carver's lake	John A Parsons	" 14	120,000
	Luce lake	Theo. H. Zintgraff	" 14	120,000
	Spring lake	Edgar Wetherbee	" 13	160,000
	Lilla lake	Albert Bogert	" 13	160,000
	Diamond lake	B. L. Rudd	" 13	160,000
Eaton	Long lake	W. L. Freemire	" 15	120,000
	Sebewa lake	" "	" 15	120,000
Hillsdale	Bear lake	Wm. C Kemp	" 14	120,000
	Baw Beese lake	" "	" 14	120,000
Jackson	Liberty pond	Reid C. Cary	" 14	120,000
	Clarke's lake	John L. De Lamater	" 14	80,000
	Fox lake	Wells W. Dew	" 14	120,000
	Round lake	Chas. J. Van Schoick	" 14	120,000
	Gillett's lake	Vernon Sullivan	" 11	120,000
Kalamazoo	Sugar Loaf lake	W. C. Kohl	" 14	120,000
Kent	Reed's lake	Consolidated Railway Co.	" 12	160,000
	Chain lake	C. C. Darling	" 12	160,000
	Long lake	" "	" 12	160,000
	Pickerel lake	" "	" 12	160,000
	Round lake	" "	" 12	160,000
	Camp lake	" "	" 12	160,000
	Skelly lake	H. A. Lamb	" 12	80,000
	Chapin lake	W. P. Hetherington	" 12	80,000
	Emmons lake	H. P. McElroy	" 12	80,000
Lapeer	Otter lake Powderhorn lake Parke lake	J. C. Mason	" 12	200,000
	Dipper lake	Will J. Till	" 12	200,000
	Bronson lake	I. M. Fisher	" 12	200,000
Lenawee	Devil's lake	J. B. Flanders	" 16	600,000
	Sand lake	Geo. A. Keil	" 16	200,000
Livingston	Pickerel lake	J. J. Van Lewen	" 11	160,000
	Island lake	Effie Josselyn	" 11	160,000
Montcalm	Baldwin lake Burgess lake	T. I. Phelps	" 11	240,000
Oakland	Pine lake	Morgan A. Rundell	" 13	400,000
	Island lake	G. S. Shattuck	" 13	400,000
	McCain lake	Morgan Gulick	" 12	200,000
Otsego	Calkins lake	O. H. Carpenter	" 16	240,000
	Cranberry lake	Jno. D. Foster	" 16	240,000

Wall-eyed Pike Plants, 1896.—CONCLUDED.

County.	Name of waters.	Depositor.	Date.	Number.
St. Joseph	Ayers lake	H. Ayers	May 13	160,000
	Fisher lake	Francis B. Carr	" 13	160,000
Van Buren	Sherman lake	Michael Gales	" 11	240,000
Washtenaw	South lake	Arl Guerin	" 11	120,000
Wayne	Detroit river	Michigan Fish Commission	" 16	4,800,000
Total				13,720,000

Black Spotted Trout Plants, 1895.

County and name of waters.	Township.	Depositor.	Date.	Number.
Newaygo:				
South branch of Pere Marquette river	Several	Mich. Fish Com.	August 14	8,000

Small Mouth Black Bass Plants, 1895.

County and name of waters.	Township.	Depositor.	Date.	Number.
Cheboygan:				
Douglas lake	Munroe	John Johnson	June 15	16,000
Genesee:				
Barnum's lake	Fenton	Levi Barnum	May 14	3,000
Copeneconie lake	Holly, Fenton and others	" "	" 14	3,000
Kalamazoo:				
Asylum lake	Kalamazoo	Herman Ostrander	" 18	6,000
Gull lake	Ross, Barry & Richland	J. T. Upjohn	" 18	9,000
White lake	Kalamazoo	C. E. Foote	" 18	9,000
Burgess lake	Eureka	W. R. Holden	" 22	5,000
Lapeer:				
Otter lake	Marathon	Charles Hatherly	" 16	3,000
Barnes lake	Richland	John L. Preston	" 16	9,000
Montcalm:				
Colby lake	Evergreen	H. L. Bailey	" 14	3,000
Muskegon:				
Duck lake	Fruitland	John R. Austin	" 25	6,000
Oakland:				
Davis lake	Springfield	F. G. Ely	" 14	3,000
Rice lake	Holly	J. H. Porter	" 14	3,000
Orchard lake	Forest, Campbell	W. Bloomfield	" 14	5,000
Mace Day lake	Waterford	A. W. Blain	" 14	5,000
Lotus lake				
Big lake	Springfield	F. G. Ely	" 14	3,000
Total				91,000

Small Mouth Black Bass Plants, 1896.

County and name of waters.	Township.	Depositor.	Date.	Number.
Antrim:				
Intermediate lake	Central Lake	John C. Mathews	May 23	12,000
Lake of the Woods	Custer	C. L. Bailey	" 18	4,000
Cass:				
Baron lake	Howard	Charles E. Smith	June 12	10,000
Emmet:				
Crooked lake	Littlefield	Charles Bullock	May 18	10,000
Pickerel lake	"	O. C. Cope	" 18	8,000
Jackson:				
Clear lake	Waterloo	Orville Gorton	" 21	4,000
Round lake	Liberty	Chas. J. Van Schoick	June 10	8,000
Kalamazoo:				
Barton lake	Schoolcraft	Henry I. Allen	May 26	6,000
Sugar Loaf lake	Schoolcraft and Portage	W. C. Kohl	" 26	6,000
West lake	Kalamazoo	C. E. Foote	" 12	6,000
White's lake	"	" "	" 12	6,000
Lyon's lake	"	" "	" 12	6,000
Kalkaska:				
Starvation lake	Glade	C. L. Bailey	" 18	4,000
Twin lakes	Glade & Cold Springs	" "	" 18	4,000
Crooked lake	Glade	" "	" 18	4,000
Indian or Squaw lake	"	" "	" 18	4,000
Kent:				
Campau lake	Caledonia	Lew D. Stark	June 14	1,000
Reed's lake	Grand Rapids	Consolidated Railway Co.	" 30	800
" "	" "	G. S. Johnson	May 26	3,000
Lapeer:				
Otter lake Powderhorn lake Park lake	Marathon	J. C. Mason	" 21	12,000
McKeon lake	Oregon	Will J. Till	" 21	6,000
Hemingway lake	Marathon	" "	" 21	6,000
Leelanau:				
Manitou lake	Manitou Island	Samuel H. Row	" 18	6,000
Lenawee:				
Devil's lake	Woodstock	Hope Welch	June 10	6,000
Sand lake	Franklin and Bainbridge	J. J. Putnam & Sons.	" 10	6,000
Livingston:				
Zuke lake	Hamburg	W. H. Bennett	" 15	4,500
Mecosta:				
Clear lake	Colfax	A. S. Hobart	" 15	4,000
Newaygo:				
Pickerel lake Kimball lake Bigand lake Little Marl lake	Brooks and Garfield.	Geo. E. Taylor	May 23	8,000
Oakland:				
Mace Day lake	Waterford	Geo. S. Hammond	June 3	6,000
St. Clair:				
Mill creek	Clyde & Kenockee	A. R. Avery	May 15	10,000
Black river	Clyde, Grant & Worth	" "	" 15	10,000
St. Joseph:				
Fisher lake	Fabius	H. H. Whipple	" 26	5,000
Kaiser lake	"	Ed. M. Shafer	" 26	5,000
Corey lake	"	J. H. Hahn	" 26	6,000
Long lake	"	H. H Whipple	" 26	6,000
Thompson lake	Sherman	E. V. Hohndue	" 12	4,000

Small Mouth Black Bass Plants, 1896—CONCLUDED.

County and name of waters.	Township.	Depositor.	Date.	Number.
Van Buren:				
Lake of the Woods	Decatur	Frank C. Stapleton	June 12	6,000
Washtenaw:				
Whitmore lake	Northport	W. H. Bennett	" 22	6,000
Wexford:				
Big Clam lake	Cadillac	H. F. Hodges	May 18	6,000
Little Clam lake				
Wayne:				
Detroit river	Detroit	Mich. Fish Com.	July 6	4,000
Total				238,800

Large Mouth Bass Plants, 1895.

County and name of waters.	Township.	Depositor.	Date.	Number.
Barry:				
Wall lake	Hope	W. D. Hayes	May 20	6,000
Danch lake	Rutland	W. J. Michael	" 20	6,000
Leach lake	Carlton	L. A. Crowell	" 20	4,000
Middle lake	"	" "	" 20	6,000
Carter lake	Irving	J. H. Neiss	" 20	6,000
Long lake	Rutland	W. D. Bennett	" 20	6,000
Cass:				
Hutchins lake	Newburg	Albert Bogert	" 27	5,000
Pleasant lake	Ontwa	Eugene D. Smith	" 27	5,000
Miller lake	Marcellus	C. S. Jones	" 27	5,000
Big Fish lake	"	" "	" 27	5,000
Saddle Bag lake				
Fish lake	"	W. L. Arnold	" 27	5,000
Fike lake	"	Robert J. Brown	" 27	5,000
Goff lake	"	E. P. McKenzie	" 27	5,000
Jackson:				
Fox lake	Hanover	W. H. Sanderson	" 24	6,000
Bibbins lake	"	T. J. Strait	" 24	6,000
Vandercook	Summit	George E. Beebe	" 24	4,000
Brown's lake				
Pleasant lake	"	" "	" 24	6,000
Kalamazoo:				
Sugar Loaf lake	Schoolcraft	Chas. W. D. Allen	" 27	5,000
Kent:				
Woodbeck lake	Oakfield	W. R. Holden	" 22	6,000
Banks lake				
Horse Shoe lake				
Half Mile lake				
County Line lake	Oakfield and Eureka	" "	" 22	5,000
Bass lake	Spencer	" "	" 22	5,000
Mecosta:				
Miller lake	Colfax	A. W. Eldridge	" 21	5,000
Muskegon:				
Wolf lake	Egleston	E. D. Magoon	" 25	6,000
Montcalm:				
Whitefish lake	Pierson	S. C. Scott	" 21	5,000
Rock lake	Richland	Edgar S. Wagar	" 21	6,000
Whitefish lake	Pierson	S. C. Scott	" 21	6,000
Turk lake	Montcalm	W. R. Holden	" 22	5,000
Total				145,000

Large Mouth Bass Plants, 1896.

County and name of waters.	Township.	Depositor.	Date.	Number.
Kalkaska:				
Lake Twenty-eight	Orange	Peter Elzcorn	May 13	6,000
Kent:				
Reed's lake	Grand Rapids	G. S. Johnson	“ 26	5,000
Campau lake	Caledonia	Lew D. Stark	June 4	2,000
Van Buren:				
Wolf lake	Almena	James Buckhout	May 12	6,000
Total				19,000

Gold Fish Distributions, 1895.

Name.	Place.	Date.	Number.
F. J. Newman	Bay City	October 19	12
F. Briggs	Battle Creek	“ 19	12
Frank Cornell	Belding	August 29	10
C. K. Hoyt	Hudsonville	September 16	15
A. S. Hill	Kalamazoo	“ 16	4
H. W. Davis	Grandville	“ 16	5
A. Chilver	Grand Rapids	August 23	15
E. C. Brown	Saginaw	October 19	25
Lincoln H. Titus	Paw Paw	August 26	10
Grant W. Gordon	Dearborn	October 24	6
Miss Mae Clark	Detroit	“ 23	6
Mrs. Wm. Connor	“	“ 23	6
Chas. T. Duffie	“	“ 20	25
C. A. Seely	“	“ 3	5
H. W. Davis	Distrib'd in Gr'd Rapids		150
Total			306

Gold Fish Distributions, 1896.

Name.	Place.	Date.	Number.
W. J. Martin	Bay City	October 14	12
E. P. Oviatt	Lansing	" 13	12
J. M. Lee	Grand Rapids	" 20	2
Mr. —— Miller	" "	" 20	2
Mr. —— Westover	" "	" 20	2
Mr. —— Orr	" "	" 20	10
Wesley Knight	" "	" 20	10
Mrs. —— Utter	" "	" 20	2
Mr. —— Inman	" "	" 20	2
Mr. —— Brewster	" "	" 20	4
Soldiers' Home	" "	" 20	6
Mr. —— Brown	" "	" 20	2
Mr. —— Bates	" "	" 20	2
State Fair	" "	" 20	2
Jas. Thiel	Mill Creek	" 20	4
H. W. Davis	Grand Rapids	" 12	60
S. Alexander	Birmingham	" 18	20
Mr. —— Brown	Saginaw	" 12	25
Lincoln H. Titus	Paw Paw	" 16	12
Alex. Baker	Ypsilanti	" 13	10
Harriet W. Larkins	Detroit	" 20	10
Myra Jones	"	" 20	10
George T. Greene	"	" 20	15
Irene C. Farquhar	"	" 20	15
J. L. Roark	"	" 15	10
Miss J. Anderson	"	" 8	5
Mrs. W. B. Pope	"	" 3	5
Detroit Normal School	"	" 18	12
J. W. Hopkins	"	September 30	6
Winifred F. Smith	"	" 18	12
Wm. H. Baxter	"	" 30	6
Public schools by Louise Miller	"	October 20	150
Mrs. Alice E. Travers		May 14	6
F. G. Jaenischen		" 14	6
Brice B. Hatter		" 14	6
Parke, Davis & Co.		" 14	12
Total			487

Carp Distributions, 1895.

County and name of waters.	Township.	Depositor.	Date.	Number.
Antrim:				
Private pond	Mancelona	W. H. Kettle	August 24	40
" "	"	E. A. Kemp	" 24	40
" "	"	" "	" 24	40
Barry:				
Mud lake	Barry	Addison Pennock	" 21	40
Gillispie lake	"	" "	" 21	40
Bullhead lake	Carlton	J. W. Foster	" 21	20
Irving Mill pond	Irving	Luther S. Mills	" 21	20
Bensie:				
Gary lake	Almira	M. W. Courson	" 24	40
Kenyon lake	"	" "	" 24	40
Calhoun:				
Aquarium	Battle Creek	F. Briggs	" 24	12
Cass:				
Private pond	Newburg	Fred Jones	" 19	100
Clare:				
Green's lake	Hatton	John Quinne	" 30	40
Chippewa:				
Trout brook	Rudgard	R. G. Trimble	October 15	25
Clinton:				
Private pond	Ovid	James Valentine	August 29	40
Dickinson:				
East lake	Breen	S. H. Bridges	October 16	19
Lake on Secs. 10, 42 and 27	"	" "	" 16	19
Emmet:				
Cecil lake	Carp Lake	W. E. Robinson	" 19	20
Genesee:				
Atlas Mill pond	Atlas	P. W. Gale	" 19	20
Private pond	Genesee	J. P. Murray	" 19	20
Long's lake	Davison	L. J. Wicker	September 4	40
Potter lake	Genesee and Lapeer	" "	" 4	40
Byron and Pine lakes	Fenton	Frank J. Sadler	" 3	40
Gogebic:				
Crozier's lake	Watersmeet	L. L. Wright	October 16	40
Mud lake	Marenisco	" "	" 16	19
Hillsdale:				
Private pond	Hillsdale	Marion G. Mosher	August 20	50
Cambria Mill pond	Cambria	Geo. H. Busch	" 20	50
Cub lake	"	Frank Weston	" 20	50
St. Joseph river	Jefferson	Clayton Powell	" 20	75
Houghton:				
Seneca lake	Calumet	John Duncan	October 15	19
Mud lake	South Lake Linden	Charles Smith	" 15	19
" "	Duncan	G. W. Shane	" 16	19
Iron:				
Private lake	Atkinson	Paul Schultz		19
Private pond	Crystal Falls	A. Lustfield		19
Isabella:				
Obrien lake	Lincoln	Birton I. Gee	August 27	80
Town Frye lake	Gilmore	N. J. Phillips	" 30	40
Jackson:				
Liberty Mill pond	Liberty	R. C. Cary	" 20	50
Kent:				
Private pond	Grandville	Vonderodde George	" 21	40
" "	Hudsonville	C. K. Hoyt	" 21	100
" "	Grand Rapids	Chas. H. Chick	" 23	40
Flat river	Vergennes	E. J. Mosher	" 29	40

Carp Distributions, 1895.—CONCLUDED.

County and name of waters.	Township.	Depositor.	Date.	Number.
Lapeer:				
Perch pond	Attica	J. R. Bellow	September 3	40
Lenawee:				
River Raisin	Adrian	C. E. Brush	August 20	50
" "	"	" "	" 20	100
Livingston:				
Dollar lake	Brighton	J. J. Van Lewen	September 2	40
Pickerel lake	"	" "	" 2	40
Marquette:				
Bancroft lake	Ishpeming	Geo. A. Newett	October 15	19
Mecosta:				
Private lake	Morton	Frank Cole	August 27	40
Pine lake	Wheatland	A. L. Hawk	" 27	4
Private pond	"	C. H. Roberts	" 27	40
Guy and Mud lakes	"	A. L. Hawk	" 27	40
Pine lake	Chippewa	James A. Roop	" 27	80
Montmorency:				
Mud lake	Vienna	Thomas E. Double	October 19	20
Muskegon:				
Christie lake	Whitehall	Christopher Kelett	August 27	40
Newaygo:				
Whipple lake	Barton	Urias Gardner	October 14	19
Orton lake	Brooks	W. H. Kritzer	August 27	40
Butterworth lake	Brown	E. O. Shaw	" 27	150
Private pond	Otis	L. M. Barnes	" 27	40
" "	Fremont	George Gould	" 27	40
Oakland:				
Martin lake	Holly	James Martin	October 19	20
Cedar lake	Brandon	Alonzo Flagler	September 3	40
Causeway lake	"	R. Kent	" 3	40
Private pond	Ortonville	John D. McIntire	" 3	40
Cedar lake	Brandon	Peter L. McIntire	" 3	40
Round lake	"	Wildor Clark	" 3	40
Private pond	Groveland	A. H. Austin	" 3	40
sceola:				
Woolworth lake	Burdell	Theodore Rogers	August 24	40
Otsego:				
Stream on Sec. 15	31 N., 2 W.	A. A. Crane	October 19	20
Ottawa:				
Private pond	Hudsonville	G. L. Guild	August 21	40
Schoolcraft:				
Mud lake	Germfask	Edward Menere	October 15	40
Tuscola:				
Private pond	Arbela	H. A. Daniels	" 19	20
Dollar lake	Millington	Robert H. Murray	September 3	40
Van Buren:				
Briggs pond	Paw Paw	C. Engle	August 21	20
Willard pond	" "	" "	" 21	20
North lake	Pine Grove & Almena	Wm. C Gibson	" 21	40
Veley's pond	Pine Grove	Charles Veley	" 21	40
Sherman's lake	Paw Paw	C. Engle	" 21	20
Brown lake	Keeler	Samuel Scott	" 22	80
Private pond	Decatur	Thomas Brandhurst	September 18	8
Wexford:				
Johnson's pond	South Branch	George W. Johnson	August 24	40
Total				3,225

Carp Plants, 1896.

County and name of waters.	Township.	Depositor.	Date.	Number.
Alpena:				
Misery bay	Alpena	W. E. Rogers	August 14	80
Baraga:				
Lake Cosgrove	Baraga	N. S. Pennock	" 15	60
Plain lake	"	" "	" 15	60
Three lakes on Section 14	Spur	George McDonald	" 15	40
Barry:				
Long lake	Hope	Dugal Campbell	" 6	100
Sawbaw lake	Rutland	D. A. Holbrook	" 6	300
Calhoun:				
Goose lake	Penfield	Edward J. Smith	" 8	400
Crawford:				
Pickerel lake	27 N., 4 W.	H. V. Howe	" 14	110
Eaton:				
Private pond	Charlotte	James Murray	" 6	100
Genesee:				
Thread pond	Barton	Abram Peer	" 8	100
Gogebic:				
Sunday lake	Wakefield	L. L. Wright	" 17	40
Crozier lake	Watersmeet	" "	" 17	120
Grand Traverse:				
Root lake	Whitewater	L. L. Lydell	" 11	60
Houghton:				
Groomer lake and stream	47 N., 36 W.	Geo. H. Houser	" 16	40
Ionia:				
Mud lake	Berlin	Ralph Crane	" 6	80
Iron:				
Private pond	Crystal Falls	A. Lustfield	" 17	75
Lake Tissetta	Mastodon	Fred Velquette	" 17	75
Kalkaska:				
Rainbow lake	Coldspring	Wm. Thompson	" 11	80
Fisher's pond	Orange	Peter Etscorn	" 11	80
Private pond	Boardman	Albert Sage	" 11	50
Kent:				
Hall's lake	Byron	George D. Hall		120
Bailey pond	Paris	S. S. Bailey		80
Private pond	"	" "		80
Lake:				
Wolf lake	Webber	Harley Bartlett	August 11	220
Lapeer:				
Skym's pond	North Branch	Wm. Skym	" 8	40
Mackinac:				
Round lake	St. Ignace	James Stevenson	" 14	60
Gallagher lake	"	" "	" 14	60
Manistee:				
Fox lake	Chandler	Neil Gallagher	" 11	50
Gallice lake	Gallice	" "	" 11	75
Barney lake	Pine	" "	" 11	50
Fond lake	Chandler	" "	" 11	75
Green's lake	Gallice	" "	" 11	50

Carp Plants, 1896.—CONCLUDED.

County and name of waters.	Township.	Depositor.	Date.	Number.
Mason:				
Lincoln lake	Hamlin and Pere Marquette	F. W. Graham	August 10	80
Mecosta:				
Wolcott pond	Big Rapids	L. E. Wolcott	" 10	40
Grass lake	Chippewa	James M. Roop	" 10	80
Montcalm:				
Steffenson's pond	Montcalm	Andrew Steffenson	" 6	50
Muskegon:				
Loveless lake	Cedar Creek	Louis Roupricht	" 7	100
Crystal lake	Whitehall	Christopher Klett	" 7	100
Newaygo:				
Whipple lake	Barton	Urias Gardner	" 7	100
Oakland:				
Long lake	Orion	Edward Miller	" 8	300
Oceana:				
Round lake	Golden	Harry M. Beals	" 6	100
Ontonagon:				
Private pond	Interior	Leonard Nelson	" 17	65
Otsego:				
Lake 15	Dover	John Goston	" 14	80
Sanilac:				
Private pond	Austin	Harrison J. Rathbun	" 11	40
Decker's pond	Lexington	George H. Decker	" 11	40
Schoolcraft:				
Mud lake	Germfask	Edward Menere	" 15	40
Shiawassee:				
Moon lake	Woodhull	Mil Pulver	" 8	400
Tuscola:				
Cass river	Vassar and others	M. D. Brainard	" 11	80
Washtenaw:				
River Raisin	Manchester	B. W. Amsden	" 6	120
Wayne:				
Private pond	Plymouth	D. W. Packard	" 7	160
Total				4,960

TEMPERATURE OF WATER.

DETROIT STATION.

Temperature of water during whitefish hatching season, from November 12, 1894, to April 27, 1895.

1894.		
Nov.	12-18	43°
	19-21	40
	22	39
	23	42
	24	43
	25	42
	26-27	45
	28	40
	29	39
	30	38
Dec.	1	38
	2	35
	3	40
	4	36
	5-6	37
	7-8	38
	9	40
	10-11	38
	12-14	40
	15-16	39
	17	42
	18-19	40
	20-23	39
	24-26	38
	27	37
	28-31	35
1895.		
Jan.	1	36
	2-3	35
	4	36
	5-6	35
	7-9	34
	10-15	33½
1895.		
Jan.	16-25	34°
	26	33
	27	33½
	28-31	33
Feb.	1-20	33
	21	35
	22-23	34
	24	33½
	25-28	34
Mar.	1	34
	2-3	33½
	4-5	33
	6-9	34
	10-18	33
	19	33½
	20-22	34
	23-24	34½
	25-29	35
	30-31	34
April	1-5	34
	6	35
	7-8	34½
	9-11	38
	12	39
	13	38
	14	38½
	15	39
	16	40
	17	39½
	18	40
	19	41
	20-27	43

Temperature of water during whitefish hatching season, from November 1, 1895, to April 22, 1896.

1895.		
Nov.	1	45°
	2-5	44
	6	44½
	7	46
	8-10	47
	11	46
	12-13	45
	14-19	44
	20	43
	21-23	42
	24-25	40
	26	43
	27	38
	28	37
	29	38
	30	39
1895.		
Dec.	1-3	37°
	4-5	36
	6-9	35
	10	34
	11-12	35
	13-15	34
	16-17	35
	18	36
	19	37
	20-22	35
	23	34½
	24-26	35
	27-28	34
	29-31	35
1896.		
Jan.	1-7	34
	8-9	33

DETROIT STATION.—*Continued.*

1896.		
Jan.	10	33½°
	11-18	33
	19	33½
	20	33
	21-31	34
Feb.	1-2	34
	3-5	33
	6-26	32
	27-28	33
	29	32
Mar.	1-3	32
	4	33
	5	32
	6-7	33
	8-13	32
	14-15	33
	16-20	32
	21-28	33
1896.		
Mar.	29-30	34°
	31	36
April	1	33
	2-4	32
	5	33
	6-8	34
	9-10	36
	11	38
	12	40
	13	42
	14-16	46
	17	48
	18	50
	19	52
	20	51
	21	52
	22	51

SAULT STE. MARIE STATION.

Temperature of water during trout and whitefish hatching season, from October 15 1894, to May 17, 1895.

1894.		
Oct.	15-31	50°
Nov.	1-2	49
	3-5	48
	6	47
	7-8	46
	9	45
	10	44
	11-14	43
	15-17	42
	18	41
	19	40
	20-21	38
	22	39
	23-25	38
	26-30	37
Dec.	1-4	37
	5-22	38
	23-24	37
	25	36
	26-31	35
1895.		
Jan.	1-2	35°
	3-31	34
Feb.	1-28	34
Mar.	1-31	34
April	1-15	34
	16	34½
	17	35
	18-20	36
	21-26	35
	27	36
	28-29	37
	30	38
May	1	38
	2	39
	3-10	40
	11-15	41
	16-17	42

Temperature of water during trout and whitefish hatching season, from October 1, 1895, to May 18, 1896.

1895.		
Oct.	1-4	50°
	5	51
	6	50
	7-10	51
	11	50
	12-13	51
	14-17	47
	18-21	45
	22	46
	23	47
	24	48
	25-28	45
	29	44
	30-31	43
Nov.	1	43
	2-5	44
	6	46
	7-8	45
	9	43
1895.		
Nov.	10-11	42°
	13	43
	14-15	44
	16-19	42
	20	39
	21	37
	22-23	38
	24-25	37
	26	36
	27	35
	28	36
	29	38
	30	36
Dec.	1	36
	2-6	35
	7	36
	9-14	34
	15-16	35
	17-20	36

SAULT STE. MARIE STATION.—*Concluded.*

1895.		
Dec.	21-22	37°
	23	36
	24-25	37
	26	36
	27-30	35
	31	33
1896.		
Jan.	1-20	33
	21	32½
	22-31	33
Feb.	1-15	33
	16-21	32½
	22-29	33
Mar.	1-31	33
April	1-12	33
	13-14	33½
	15-17	34
	18	34½
1896.		
April	19	35°
	20-21	36
	22-23	37
	24	38
	25	39
	26-27	40
	28-29	39
	30	40
May	1	40
	2	41
	3-5	42
	6-8	43
	9-12	44
	13	47
	14-15	45
	16	44
	17	45
	18	44½

PARIS STATION.

Temperature of water during trout hatching season from September 17, 1894, to July 1, 1895.

1894.		
Sept.	15	51°
	16	50
	17	48
	18	46
	19	44
	20	46
	21	48
	22	50
	23	47
	24	46
	25	44
	26	45
	27	47
	28	46
	29	46
	30	48
Oct.	1	44
	2-5	46
	6	44
	7-8	45
	9-11	43
	12	44
	13	45
	14	44
	15	40
	16-17	45
	18	43
	19-20	46
	21-22	48
	23	46
	24	45
	25	43
	26	47
	27	46
	28-29	45
	30	46
	31	45
Nov.	1-3	46
	4-5	45
	6	42
	7-8	43
	9	42
	10	41
1894.		
Nov.	11-13	40°
	14-17	42
	18	41
	20	38
	21	43
	22-23	42
	24	44
	25-26	42
	27	41
	28-30	40
Dec.	1-3	42
	4	39
	5-6	42
	7	43
	8	45
	9-10	42
	11-12	44
	13	43
	14-15	42
	16	45
	17	42
	18-20	40
	21	44
	22	40
	23	41
	24	42
	25	40
	26-27	38
	28	36
	29-31	38
1895.		
Jan.	1-2	38
	3	39
	4-5	38
	6	40
	7	42
	8	38
	9	37
	10	39
	11	40
	12	39
	13-15	42
	16-17	39
	18	38

PARIS STATION.—*Concluded.*

1895.		
Jan.	19	40°
	20	44
	21	40
	22-23	38
	24	36
	25	40
	26	39
	27-29	38
	30-31	36
Feb.	1	38
	2	34
	3-4	37
	5	35
	6-9	36
	10	37
	11-14	38
	15	36
	16	37
	17	38
	18	39
	19	37
	20	38
	21	40
	22	36
	23	37
	24	40
	25	38
	26	40
	27	43
	28	40
Mar.	1	40
	2-4	36
	5-6	37
	7	39
	8	40
	9	38
	10	40
	11	35
	12	37
	13	40
	14	35
	15	36
	16	37
	17-18	38
	19	40
	20-22	38
	23	39
	24-31	38
Apr.	1-3	38
	4	39
	5	40
	6	41
	7-8	42
	9	43
	10	40
1895.		
Apr.	11-12	42°
	13	43
	14-16	44
	17	43
	18	42
	19	43
	20-21	44
	22	46
	23	45
	24	44
	25	43
	26	44
	27-28	45
	29-30	46
May	1	46
	2-3	48
	4-5	47
	7-11	46
	12	40
	13	38
	14-16	40
	17	42
	18	44
	19	42
	20	40
	21	42
	22	43
	23	44
	24	45
	25	44
	26	45
	27	46
	28	45
	29	48
	30	47
	31	47
June	1	45
	2-4	46
	5-8	48
	9	47
	10-12	45
	13-14	47
	15-16	49
	17-18	50
	19	51
	20-21	50
	22-23	52
	24	49
	25	48
	26-27	49
	28	48
	29	47
	30	48
July	1	49

PARIS STATION.

Temperature of water during trout hatching season from September 15, 1895, to July 1, 1896.

1895.		
Sept.	15-17	50°
	18-22	52
	23	50
	24-26	49
	27-30	48
Oct.	1-2	45
	3	44
	4-5	46
	6-7	49
	8	45
	9-10	44
	11	48
	12	46
	13	45
	14	48
	15	45
	16	48
	17	47
	18	48
	19	47
	20	40
	21-22	42
	23	43
	24	46
	25	47
	26	46
	27-30	42
	31	43
Nov.	1-2	42
	3	46
	4	48
	5	45
	6-7	48
	8	46
	9	44
	10	40
	11-12	42
	13	43
	14-15	44
	16-18	45
	19	43
	20-21	40
	22	42
	23	41
	24-25	40
	26-27	42
	28	43
	29	44
	30	40
Dec.	1-2	40
	3	39
	4-6	40
	7	42
	8-9	38
	10-12	40
	13	37
	14	38
	15	39
	16	38
	17	41
	18-19	42
	20	41
1895.		
Dec.	21	42°
	22	43
	23	44
	24	43
	25	41
	26	42
	27	41
	28	42
	29	41
	30-31	40
1896.		
Jan.	1	38
	2	40
	3	39
	4-5	34
	6	39
	7-8	40
	9-11	43
	12	40
	13	39
	14	41
	15	40
	16-18	41
	19	42
	20-21	44
	22	39
	23	40
	24-25	44
	26	42
	27	40
	28	42
	29	43
	30	44
	31	43
Feb.	1	43
	2	42
	3	40
	4	42
	5	41
	6	40
	7	41
	8-10	40
	11	37
	12	36
	13-14	38
	15	40
	16	36
	17	35
	18	36
	19	38
	20	36
	21-22	38
	23-24	40
	25	37
	26	40
	27-28	41
	29	38
Mar.	1-5	38
	6	40
	7-8	39
	9-10	40
	11	38
	12	37

PARIS STATION.—*Concluded.*

1896.		
Mar.	13	35°
	14	36
	15	37
	16	38
	17	40
	18	41
	19	42
	20	37
	21-22	38
	23	36
	24	37
	25	40
	26-27	39
	28-29	40
	30	41
	31	40
Apr.	1	41
	2-4	38
	5	39
	6-9	40
	10	41
	11	43
	12	44
	13-15	45
	16-17	48
	18	49
	19	48
	20-21	46
	22	43
	23-24	42
	25	44
	26	46
	27	47
	28	46
	29-30	48
May	1	47
	2-5	48
1896.		
May	6	47°
	7-10	48
	11	49
	12-14	48
	15-16	47
	17-20	48
	21	49
	22	50
	23	52
	24	50
	25	52
	26	50
	27	48
	28	50
	29-31	48
June	1	46
	2	47
	3	49
	4	50
	5	51
	6-7	52
	8	53
	9	51
	10	49
	11	48
	12	49
	13-14	48
	15	49
	16-18	48
	19	49
	20-21	50
	22-23	49
	24	48
	25-26	50
	27-29	49
	30	47

CHARLEVOIX RELIEF STATION.

Temperature of water during whitefish hatching season from the time the eyed eggs were put in the jars, February 17 to April 25, 1895,

1895.		
Feb.	17-18	33°
	19-24	33½
	25-28	33
Mar.	1-2	32½
	3-12	33
	13-14	34
	15-22	33
	23-25	34
	26-27	34½
1895.		
Mar.	28-31	34°
Apr.	1-2	35
	3-4	34
	5	35
	6-14	36
	15-18	38
	19-21	39
	22-25	40

CHARLEVOIX RELIEF STATION.

Temperature of water during whitefish hatching season from November 15, 1895, to April 28, 1896.

1895.		
Nov.	15-17	44°
	18-22	43
	23-24	42
	25-26	43
	27	42
	28	41½
	29	41
	30	40
Dec.	1-3	40
	4	38½
	5-7	38
	8-9	37
	10-12	38
	13	36½
	14-17	36
	18-19	37
	20	38
	21	37
	22-24	36
	25-26	35½
	27	35
	28-30	36
	31	35
1896.		
Jan.	1-3	34
	4-9	33
	10-12	32½
1896.		
Jan.	13-14	32°
	15-22	33
	23-31	34
Feb.	1-24	33
	24-26	34
	27-29	33
Mar.	1-2	33
	3-5	34
	6-12	33
	13-15	34
	16-18	33½
	19-22	34
	23-31	--
Apr.	1-2	35½
	3-8	36
	9	35½
	10	34½
	10	36½
	12-15	38
	16-17	39
	18-20	38
	21-22	39
	23	40
	24	39
	25-26	40
	27-28	42

INSURANCE.

On Detroit hatchery, building	$2,000 00
On automatic hatching jars, Detroit	1,600 00
On Paris hatchery, building	2,500 00
On troughs and equipment	650 00
On car house at Paris	125 00
On overseers' dwelling at Paris	1,000 00
On old hatchery building, Paris	500 00
On tanks, boxes, etc.	200 00
On fixtures and tools	100 00
On employés' dwelling, Paris	400 00
On barn at Paris	100 00
On wagons and harness at Paris	50 00
On Sault Ste. Marie hatchery building	4,000 00
On fixtures and equipment	500 00
Total	$13,725 00

SUMMARY OF INVENTORY AUGUST 1, 1896.

Detroit station	$15,839 92
Paris station	19,622 65
Sault Ste. Marie station	6,191 37
Glenwood station	245 71
Charlevoix station	955 85
Car and equipment	4,279 39
Cascade station	235 00
Secretary's office	586 97
Total	$47,956 36

FINANCIAL STATEMENT.

1894. Oct. 1	Overdraft		$1,434 48
	From State Treasurer during quarter ending December 31	$12,225 00	
	From other sources	2,840 24	
	Vouchers paid during quarter		13,627 87
Dec. 31	Balance		2 89
		$15,065 24	$15,065 24
1895. Jan. 1	Cash on hand	$2 89	
	From State Treasurer during quarter ending March 31	9,450 00	
	From other sources	24 57	
	Vouchers paid during quarter		$5,640 12
Mar. 31	Balance		3,837 34
		$9,477 46	$9,477 46
April 1	Cash on hand	$3,837 34	
	From State Treasurer during quarter ending June 30	2,000 00	
	Vouchers paid during quarter		$5,531 78
June 30	Balance		305 56
		$5,837 34	$5,837 34
July 1	Cash on hand	$305 56	
	From State Treasurer during quarter ending September 30	11,750 00	
	Vouchers paid during quarter		$8,715 79
Sept. 30	Balance		3,339 77
		$12,055 56	$12,055 56
Oct. 1	Cash on hand	$3,339 77	
	From State Treasurer during quarter ending December 31	6,875 00	
	From other sources	3,250 22	
	Vouchers paid during quarter		$13,027 84
Dec. 31	Balance		437 15
		$13,464 99	$13,464 99
1896. Jan. 1	Cash on hand	$437 15	
	From State Treasurer during quarter ending March 31	11,875 00	
	Vouchers paid during quarter		$7,787 73
Mar. 31	Balance		4,524 42
		$12,312 15	$12,312 15
April 1	Cash on hand	$4,524 42	
	From State Treasurer during quarter ending June 30	6,875 00	
	Vouchers paid during quarter		$6,956 80
June 30	Balance		4,442 62
		$11,399 42	$11,399 42
July 1	Cash on hand	$4,442 62	
	From State Treasurer during quarter ending September 30	6,875 00	
	Vouchers paid during quarter		$6,827 99
Sept. 30	Balance		4,489 63
		$11,317 62	$11,317 62

THE FOOD SUPPLY OF THE FISH IN THE GREAT LAKES.

BY PROF. H. B. WARD.

[From the Nebraska Literary Magazine, Lincoln, Neb, November, 1895.]

When the early settlers made their homes along the shores of the Great Lakes, the waters of these inland seas teemed with fish. A cheap and apparently inexhaustible supply of food lay within easy reach, and they drew from it unstinted, nor was it strange that, with the increasing population and ever-widening means of communication, delicacies so tempting as the whitefish and lake trout were eagerly sought after in the markets of the neighboring cities, and that the ingenuity of generations of fishing folk was taxed to invent means of securing the fish—until finally, in the face of a growing demand and of improved apparatus for trapping the fish, natural methods of increase did not keep pace with the draft on the supply, and lake fish began to grow scarcer year by year. Artificial propagation had been tried in Europe, had proved a successful means of restocking depleted streams and ponds, and the newly founded fish boards of various states, charged in at least one case, Michigan, with the especial care of the whitefish, sought to perfect methods for hatching whitefish eggs. They were confident that therein lay the remedy for a great national calamity that seemed fast approaching—the loss of a food supply which, on the one hand, in its capture and distribution, gave employment to hundreds of men and vessels, and on the other furnished a cheap and agreeable supply of food to a large part of the central United States. But the methods which were so eminently successful in other instances have failed of final success in the Great Lakes. The annual catch of whitefish seems to be on the decline in spite of large sums spent by State and national fish commissions in hatching the fry and distributing them in the waters of the lakes. It has been a keen disappointment to all interested in fish culture that more immediate and pronounced results have not followed the extensive yearly plants of the fry; and some have attempted to explain the apparent failure on the ground that the present destructive methods of fishing effectually forbid any increase in the number of fish. They have, therefore, called for more stringent legislative regulations concerning methods of fishing, and for increased activity and artificial propagation. On the other hand it is evident that existing methods of fish culture may be open to criticism, and that the remedy as well as the fault must be sought here.

In an address before the World's Fishery Congress at Chicago in 1893, Professor J. E. Reighard says on this point:

"If we inquire into the facts concerning the sufficiency of the present methods of artificial propagation, we find that so far as concerns the whitefish there is no question as to the success of the earlier stages of the process. Several hundred million ova are taken annually and placed in the hatcheries, and of these usually from 80 to 90 per cent are hatched and placed in the waters of the Great Lakes—165,000,000 in Lake Erie alone in 1888.

"This is very nearly all that is known about these young whitefish. About their food habits we know only that in captivity they eat certain species of Crustacea. Whether in their natural habitat they eat other animals in addition to these Crustacea, or in preference to them, we do not know. It is uncertain at what age they begin to take food or how much they require. We do not know their natural enemies. We do not know whether they thrive best in running water or standing water, in shallow water or in deep water, whether at the surface or near the bottom. What changes of habitat or of food habits the fish undergo as they grow older is still a deeper mystery.

"Our problem is to place young whitefish in the Great Lakes under such conditions that as large a number as possible of them shall grow into adult fish. It is clear that one of these elements in this problem, namely, the whitefish, we know but little.

"What, then, do we know of the other elements of the problem, the Great Lakes themselves? Individual naturalists have made efforts from time to time to study one or another of the groups of animals living in the lakes. These efforts have been always circumscribed by the facilities at hand, by the time that could be devoted to the subject, by the small area examined, or by the small number of animals taken into account. Although much excellent work has resulted from these efforts, it remains true that there has been thus far no attempt to secure an accurate knowledge of all the conditions existing in any one locality, and no attempt to study exhaustively a single group of animals and plants of the lakes. We are still at the beginning so far as concerns a knowledge of life conditions in these lakes, the conditions with which we surround our young whitefish. If we could assume that the conditions are uniform over the whole area of the Great Lakes, then since the young whitefish are natives of these lakes, it might be a safe conclusion that they will find the conditions in one locality as well for them as in another. But there are no facts which support the view that the conditions are uniform over the lakes.

"We are thus in the position of bringing together under unknown conditions two things, both of unknown character, and we expect as a result to get a third thing—marketable whitefish. Should we not pursue our object more intelligently by first determining the characteristics of the materials with which we have to work?"

For ten years the Michigan Fish Commission had been carrying out a systematic investigation of the inland lakes of that State and had collected most valuable evidence on the biological conditions in these smaller bodies of water. The results of this survey, even as yet incomplete, have been immediate and invaluable, and it was a natural step when, under the advice of Professor Reighard, it was decided to extend operations to the Great Lakes themselves. In the summer of 1893 a scientific laboratory was maintained on Lake St. Clair, and, under the guidance of the director, Professor J. E. Reighard of the University of Michigan, a party of six specialists devoted two months to the study of the life in the lake. In 1894 Charlevoix, on the northeastern shore of Lake Michigan, was selected as a site for work, and owing to the absence of Professor Reighard in Europe, the writer was placed in charge.

Lake St. Clair has long been famous as the spawning ground for the whitefish; it is comparatively shallow, having a maximum depth of but a little more than six meters, and is of limited area. Both inflow and outflow are very large, and in fact the lake constitutes hardly more than a slight enlargement in the course of the stream connecting Lakes Huron and Erie.

In the waters of the Charlevoix region whitefish are caught the year round, and Lake Michigan has an area of more than 23,000 square miles and a maximum depth of 870 feet. It is estimated to contain at least one-tenth of all the fresh water of the globe. On the other hand the inflow and outflow are so inconsiderable in comparison that the volume may be said to be stable. Furthermore, the amount of shallow water is meagre, the area included between the shore and the ten-fathom line constituting hardly an appreciable amount on the chart of the lake; and yet this depth is more than two and one-half times the maximum of Lake St. Clair. The shallow area being thus limited, there is a relative scarcity of the larger plants which are found only in areas of limited depth; and the development of the strictly littoral forms is further hindered by the storms which subject the shore to constant change and prohibit on it any permanent plant growth.

It must also be remembered that light and temperature decrease rapidly with increase in depth while at the same time the pressure to which organisms are subjected increases with equal rapidity. Hence, the considerable depth of the major part of the lake affects very markedly the conditions for existence. In these respects Lake Michigan affords a strong contrast to the ordinary inland lake, while it is on the other hand a typical representative of the great inland seas. Similar conditions hardly exist elsewhere in the civilized world. It should be remembered that the work of European investigators has been carried on in lakes of comparatively limited area and depth, and that results characteristic of such conditions cannot, without further evidence, be extended to the larger bodies of water.

It must be noted that the question of food supply for the fish is peculiarly unlike the similar problems in agriculture. The food animals which come under our immediate attention are almost without exception herbivorous. The supply of food is drawn directly from the inorganic material in earth, air, and water, through the single intermediate step of the grasses, grains, and various forage plants. The chain of biological relations in this case is short and simple in its main features. Furthermore, constant and careful study by many workers in scientific institutions and on experimental fields has done much to explain the details of the process. The preparation and enrichment of the soil, the development of the seed, the growth of the plant, the dangers that threaten it, the diseases and pests that attack it, its protection and improvement, are all subjects of continued investigation. On the other hand, the pisciculturist has had no such aid, and, worse than that, often does not know even the immediate food of the fish or its amount and distribution, while concerning the more remote questions he has hardly thought to ask for their solution. In fresh water there are few large plants, in the Great Lakes a still scantier amount. Among all the fish there are none that depend on these plants for food supply; they are purely carnivorous.

In the light of the universal dependence of animal life upon plant life, one of the most fundamental questions for the fish culturist is the primitive food supply of the lakes in its character, amount, and distribution, since on this evidently depend the possibilities of fish culture, and with variations in it are connected necessarily variations in the number of fish. Unless the primitive food supply be abundant at the present time, all efforts to increase the number of fish will be only partially successful, and, unless the food of the fry is to be found in sufficient quantities in that locality when the fry are planted, the maximum number can never attain to the adult condition. The subject is too large for the limits of one paper or of a single series of investigations. Here I desire to present some results drawn from the work on Lake St. Clair and Lake Michigan with reference to the general question of the source of the food supply, its character, amount, and distribution. The more particular question with reference to the whitefish has been discussed elsewhere.

The source of food supply is not to be sought in the streams flowing into the lake. The amount brought in this way constitutes not only a very small part of the total volume, far too insignificant to be an important factor in the question, but it is furthermore chiefly inorganic matter in suspension or solution which is contributed from this source. The very limited development of bottom flora precludes the possibility of considering it the source of food supply, and the barren character of the littoral zone shows that from it is derived only inorganic matter by wave action. From the atmosphere comes in the rain much valuable material, but here exclusively inorganic. It is clear, then, that the primitive organic food material does not reach the Great Lakes from some source or other apart from them; it must be sought in the water itself.

If at any point in the clear, free water of the lake a net of finest miller's gauze be lowered to a depth of a few meters or more, and raised so as to strain the water and collect whatever may be present, it will be found on subsequent examination to contain numerous minute organisms, plant and animal, in varying quantity. It matters not whether the place of the experiment be near the shore or distant from it, in shallow or deep water, or whether the net be lowered only a short distance or to the bottom; there will always be obtained a certain quantity of life from the water, varying in amount with different circumstances. All the organisms obtained, both plant and animal, are characterized by their minute size, and are evidently unable by their own powers of locomotion to influence materially their position in the water. The environment to which they are subject is the result of external agencies and cannot be modified by their own efforts. They do not seek the bottom or the shore for rest, but remain always floating in the open water. All such forms together constitute what is called the *plankton*. Near the shore the plankton is corrupted by the addition of migrants from the littoral fauna and flora, and in proximity to the bottom some additions come to it from the bathybic (bottom-living) forms; but throughout by far the greater part of the water the plankton is found unmixed with other elements. Although present in small lakes and ponds it is more characteristic of larger bodies of water, both fresh and salt. In fresh water the fish alone invade its territory, and yet there are few fish that depend upon it directly for food. But the biological relations will be clearer after a consideration of some of the widely different forms of life included under the term plankton.

Four elements constitute the plankton of the Great Lakes, the unicellular plants and animals, or the Protophyta and Protozoa, the Rotifera, and the Crustacea. The number of species of each which are found in the plankton of the Great Lakes is limited, in fact not more than half as many as can be had from smaller bodies of water, but each species is present in an enormous number of individuals. Kellicott has calculated that of a single protophyte *(Stephanodiscus)* eight tons pass daily from Lake Erie into the Niagara river.

These forms together constitute the primitive food supply of the water, and the Protophyta are the fundamental element. They float in a nutritive fluid, the water of the lake which holds in solution inorganic substances obtained from the air, water, and shore, and brought down by various streams. In common with other green plants, they are able to manufacture out of this inorganic matter living material. Leuckart was the first to point out that since chemical action proceeds most rapidly where the proportion of surface to volume is the greatest, these organisms are peculiarly adapted to rapid growth. And since with them reproduction is clearly growth beyond the limits of the individual and consequent division into two organisms, under favorable conditions of light, temperature, and so forth, generation follows generation, with extraordinary rapidity, myriads are produced and are destroyed in every moment. These Protophyta of the plankton are then the actual elementary food supply, and all other forms of the plankton as well as all higher forms are in last analysis dependent upon them.

With them, however, may be included in the primitive food supply the other elements of the plankton. The Protozoa subsist in general on the Protophyta, the Rotifera are dependent upon both, and the Crustacea make way with whatever falls in their way. This last group usually predominates in the plankton, constituting in most cases by far the larger part of the entire volume. It is also the immediate source of fish food, serving directly as the food of the fry and rarely of the adult fish also, as in the case of the lake herring. Of the adult food fish the trout are piscivorous, subsisting on the herring and smaller forms, while the food of the various species of whitefish consists of bottom forms, such as *mollusks, insect larvæ, and crustaceans of medium size*, all of which are dependent upon the plankton for their food supply.

The fundamental position occupied by the plankton in the series of food relations in the Great Lakes renders it in the highest degree advisable that its quality, quantity, and distribution be accurately determined. The method employed in obtaining material for this determination is peculiar. In the case of ordinary collecting a net is towed behind the boat for an indefinite distance and only such part of the "catch" is utilized as may be convenient. Here the exact amount, and the volume of water from which it is taken are necessary factors in estimating the relative fertility of the water. The boat is brought to anchor, a net of peculiar construction is lowered to the bottom, and after a moment hauled vertically to the surface. The time consumed in the haul is recorded, as are also the depth, temperatures of air top and bottom, and if possible the character of the bottom, the condition of the sky and surface of the water, and the amount of current, if any, that exists at this point. At each point a number of hauls are made from varying depths, and the total amount of material obtained in each haul is preserved and bottled so carefully that the loss is very small. The error is always negative, however, and the amount obtained can be greater than is present only if foreign matter be included, and this is easily detected by the microscope. The material thus collected and preserved is retained in alcohol-filled vials for future study.

The ordinary method of estimating the volume is to place all the material from a single haul in a long graduated tube closed at the lower end, and after twenty-four hours of settling to read the volume in the tube as exactly as possible. It is evident that a very loose flocculent plankton will settle less rapidly than a denser mass, and that both will show irregularities rendering the reading hardly more than an approximation. This volumetric method is thus somewhat inexact, but probably correct within reasonable limits. It has the advantage of comparative rapidity, and since the material remains under alcohol during the entire process it suffers no injury. The gravimetric method, advocated by some investigators, consists in drying and weighing the entire mass of a plankton haul, and this is held to be more exact than the previous method. Great difficulty is found in weighing just at the time when all the external water is driven off, but when that which enters into structure is retained. The fatal objection to the method is, however, that the material when once dried is useless for further study. I have proposed a combination of the two methods which will be valuable in certain cases, but in general the volumetric is no doubt sufficiently accurate.

The qualitative determination of a haul may be made by a method of approximation or by enumeration. In the first case the plankton is poured into a very shallow dish, and the observer estimates the percentage of each species present. Such a procedure gives but a very general idea and evidently depends entirely upon the judgment of the observer. In the other method the total amount of a haul is diluted with alcohol to a fixed volume, then thoroughly shaken up and three small tests, of 1 cc., for instance, removed at random, spread upon a ruled plate, and the number of each species actually counted under the microscope. By averaging the three sample tests and by multiplying the result the total number of the species found in the haul is estimated. The amount of labor involved in laboriously counting for each of the twenty to one hundred species in each plankton haul is enormous, and yet for the determination of the relative importance of the various elements it seems to be necessary. For the plankton of Lake St. Clair and Lake Michigan this part of the work has not yet been done.

One further process is necessary. The results of the calculations just described are characteristic only for the particular net used and at the actual velocity, and it is necessary to express them in some more general terms. This may be done by multiplying by a correction such as to give the amount of plankton under one square meter of surface; the result will be the total amount contained in a column of water one meter square with a height equal to the depth of the haul. If, now, this be divided by the depth of the haul, the result will be the average amount of plankton per cubic meter of water, or the relative amount at the place and time of making the haul.

In Lake St. Clair there were made twenty-seven bottom hauls, two from each station except the first; the amount of plankton per cubic meter of water obtained in each haul is in the following table:

NO. OF STATION.	I	II	III	IV	V	VI	VII	VIII	IX	X	XIII	XIV	XV	XVI	AV.
Volume of plankton in cubic centimeters per cubic meter of water.	4.97	1.44 2.68	2.76 3.89	2.01 2.01	2.74 3.62	2.29 3.08	3.69 3.69	2.70 3.01	2.54 2.39	4.15 4.15	4.79 3.97	3.60 3.31	1.80 2.42	1.90 2.33	3.03

From Lake Michigan, near Charlevoix, eighteen bottom hauls show the following results:

NO. OF STATION.	I	II	III	IV	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XX	XXI	XXII	AV.
Volume of plankton in cubic centimeters per cubic meter of water....	1.64	3.82 3.20	2.70	4.91	4.46	2.01	1.52	5.68	4.77	8.16	5.34	5.38	1.23	2.49	2.68	4.03	2.41	3.69

In Round and Pine lakes, two connecting inland lakes which have immediate and free connection with Lake Michigan at Charlevoix, the following amounts were obtained in nine bottom hauls:

NO. OF STATION.	V	VI	VII	VIII	XXIII	XXIV	XXV	XXVI	AV.
Volume of plankton in cubic centimeters per cubic meter of waters........................	2.88	2.28	3.14	5.84 5.27	3.96	6.88	3.17	2.34	3.97

In comparison with other lakes which have been measured in Germany, all of these are very poor in plankton, Dobersdorfer See, containing, for example, as much as 62.1 cc. of plankton per cubic meter of water. And yet the small amount which is present constitutes *in toto* a tremendous mass. The estimated volume of Lake Michigan is about 7,434 millions of cubic meters, and if the average of the lake contain an amount of plankton only equal to the least amount in any bottom haul at Charlevoix, it would make a solid mass of plankton in the entire lake of over *eleven thousand cubic meters.*

The distribution of this mass is of the greatest practical moment in fish culture, and here are contained in fact three problems: (1) seasonal, (2) areal, (3) vertical distribution. It is evident that only long continued observations in the same region can throw light on the question of seasonable distribution. Studies on lakes in Holstein are the source of our present knowledge; they show a minimum in February and a maximum in September, connected by a variable line of increase and decrease. The results of consecutive years exhibit marked differences in the extremes, both as to time and amount, and yet there is a general agreement in the increase of life with rising temperature and decrease with the lowering of the same.

Areal or horizontal distribution must be determined by comparison of observations made within a limited time, since throughout the year there is, as already explained, a progressive variation due to other causes. The series of hauls made at St. Clair and Charlevoix are peculiarly adapted to throw light on this question, since each series falls within a period of less than two weeks and both were made also at about the same season of the year. The results of the work at Charlevoix, which covered the greater variety of conditions in depth, distance from shore, and number of hauls, are represented graphically on plates I. and II. Each vertical line represents a station, and on it are set off on plate I. the depth of the haul, the total volume, and the volume per cubic meter of water. By connecting similar points, lines are produced which represent the changes of these elements from station to station. The various stations are arranged in order of depth with the shallowest at the right so that the dotted line of depth (D) continually descends toward the left. Considering first the conditions in Lake Michigan (1 *A*) it is evident that the line of total volumes (T) shows a rapid increase at first, then a region of uncertain fluctuation in which the greatest variation (xix) is undoubtedly due to the presence of foreign matter,* and finally a second decided increase with the sharp plunge downward of the line of depth. Compare these two lines; the total volume increases at first more rapidly and in the last half of its course less rapidly than the depth. The line of relative volume, *i. e.*, volume per cubic meter of water (R), steadily ascends towards the left. One station alone (xix) excepted, it swerves but little from the fine dotted line which connects its two ends and which may be said to indicate the average tendency: Compared with the line of depth it is clear that the relative volume decreases steadily with increasing depth of water. On plate I. *B* are represented in the same way the results of a smaller number of hauls in the two inland lakes of the Charlevoix region already mentioned. An examination of the lines shows that the principles already demonstrated for the great lake hold true in general here also. It may be that the more limited environment of the smaller area and shallower water introduces other factors and gives rise in this way to the apparently greater irregularities in this case. Comparing the results from Round and Pine lakes with those from equal depths in Lake Michigan (I. *A*) it is evident that excepting the two shallowest stations, the great lake possesses a much larger amount of plankton. It is an interesting indication of the limited food supply in Pine lake, especially that very few fish are found in its waters while adjacent lakes are well populated.

The table of bottom hauls from Lake St. Clair, given on page 115, is strong evidence that at the same point the amount of plankton to be obtained at any time is comparatively uniform. Two bottom hauls were made at each station after the first. These two were separated by a considerable time interval. Now, if the plankton were massed in so called "swarms," it would be altogether probable that the two hauls would in a number of cases be decidedly different in amount according as they included a swarm or only the more barren interspaces. But the table shows that many of the pairs agree exactly, and that ninety per cent of them do not differ from each other by so much as one-fifth. Again, among the hauls in Lake Michigan (Plate I. *A*) there is only one, XIX, which shows any considerable difference from those made at equal, or nearly equal, depths, and this one, XIX., owes its extreme volume, as already mentioned, to the presence of a quantity of foreign matter (sand) carried into the net by some accident. This evidence may fairly be regarded as establishing for the same body of water the principle of equal amounts of plankton at equal depths.

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* The fine dotted line from XVIII to XX represents more nearly the true volume.

In determining the vertical distribution of plankton, two methods are possible. A closable net may be sunk to any depth, opened, drawn up a given distance, and then closed and brought to the surface. The amount of plankton included is, then, that which was in the part of the water through which the net passed while open. Such a method would be the most exact, but closable nets are more difficult to manipulate and sometimes unreliable, so that the method of subtraction is more often employed. At each station hauls are made from a series of depths; 2, 5, 10, 25, 50, and 100 meters were the artificial strata made in the Charlevoix work, each series being concluded or interrupted by a haul from the bottom to the next higher limit. By this means the following amounts were obtained from Lake Michigan. The figures represent in all the tables cubic centimeters of volume:

No. of station	IX	X	XI	XIII	XV	XVI	XVII	XVIII	XIX	XX	XXI	XXII
2 m.-surface	19.4	18.5	22.1	28.4	25.3	27.2	23.4	26.3	25.7	18.5	23.2	17.7
5 m.-surface	40.7	26.3	35.3	41.6	31.1	42.4	44.4	33.7	34.9	31.7	35.1	25.0
10 m.-surface	54.7	47.8	66.6	79.6	53.4	80.9	88.7	49.2	58.8	49.6	50.3	49.4
25 m.-surface	117.3	96.8	115.5	169.2	......	126.3	159.3	90.1	118.5	82.9	88.7	75.8
50 m.-surface	116.0	106.8	157.8	143.2	......	......	179.2	89.6	?	110.1	......	101.4
Bottom-surface	......	......	170.3	......	......	......	168.0	......	......	......	......	......
Depth of bottom haul in meters	26	53.	111	30	10	23.5	130	36	36	41	22	42

By subtracting consecutive hauls at any station the amounts in the several artificial strata are secured.

No. of station	IX	X	XI	XIII	XV	XVI	XVII	XVIII	XIX	XX	XXI	XXII
2 m.-surface	19.4	18.5	22.1	28.4	25.3	27.2	23.4	26.3	25.7	18.5	23.2	17.7
5 m.-2 m.	21.4	7.8	13.2	13.2	5.8	15.2	21.0	7.4	9.2	13.2	11.9	7.2
10 m.-5 m.	18.9	21.5	31.3	38.0	22.3	38.6	44.3	15.6	23.9	17.9	15.2	24.4
25 m -10 m.	62.6	49.1	48.9	89.6	......	45.4	70.6	40.9	59.7	33.3	38.4	26.4
50 m.-25 m.	-1.3	10.0	42.4	-26.1	......	......	19.9	-0.5	?	27.2	......	25.5
Bottom-50 m.	......	......	12.5	......	......	......	-18.8	......	......	......	......	......

Dividing the amount in each stratum by the thickness of the stratum in meters, the result will represent the amount of plankton per cubic meter of water in each of the artificial strata.

No. of station	IX	X	XI	XIII	XV	XVI	XVII	XVIII	XIX	XX	XXI	XXII	AV.
2 m.-surface	9.7	9.2	11.0	14.2	12.7	13.6	11.7	13.1	12.9	9.2	11.6	8.9	11.5
5 m.-2 m.	7.1	2.6	4.4	4.4	1.9	5.1	7.0	2.5	3.1	4.4	4.0	2.4	4.8
10 m.-5 m.	2.8	4.3	6.3	7.6	4.5	7.7	8.9	3.1	4.8	3.6	3.0	4.9	5.1
25 m.-10 m.	4.2	3.3	3.3	6.0	......	3.0	4.7	2.7	4.0	2.2	2.6	1.8	3.2
50 m.-25 m.	-1.3	0.4	1.7	-5.2	......	......	0.8	0.0	?	1.7	......	1.5	-0.1
Bottom-50 m.	......	......	0.2	......	......	......	-0.2	......	......	......	......	......	0.0

These results for Lake Michigan are expressed graphically in Plate II. *A;* the other part of the plate (II. *B)* shows like results from Round and Pine lakes. The line of depth *(D)* is the same as on Plate I. The amount of plankton per cubic meter of water in the surface stratum, as shown by the line *S—S*, is far greater than that in any other stratum. The amount is variable; and its fluctuations seem on comparison of the lines to be independent: (1) of the depth, (2) of the total volume, (3) of the time of day,* (4) of the temperature of the water.*

It may be that the variations in the amount of plankton present in the surface stratum are due to the combination of two or more of the factors cited; but their independence of any one factor can easily be seen by noting the number of cases of opposite trend in the lines.

In the work in Lake St. Clair it was also shown that the surface stratum contained from one and one-quarter to two times as great a volume of plankton per cubic meter of water as any other part of the depth which was, to be sure, inconsiderable—not exceeding 5.5 meters. The same holds true for the lakes in Holstein, and may probably be regarded as a fundamental principle in the vertical distribution of the plankton. While the plankton is most closely massed in the superficial stratum of two meters, it is still not to be found at the immediate surface in the day time. A net of special construction was towed just at the surface of the water for hours during the trips of our boat at Charlevoix and never made a "catch" of appreciable volume during the hours of the day; but when towing was tried after nightfall at the same depth a large amount was taken. It is probable that a daily migration takes place which carries the mass of the surface plankton down a short distance in the day time and brings it back to the immediate surface with the coming of darkness.

The three intermediate strata, 2-5 m., 5-10 m., and 10-25 m., possess on the average about the same amount of plankton per cubic meter of water. The amount found in any one of them varies exceedingly, and each has at certain stations more than either of the others. Curiously the upper of the three strata (2-5 m.) has, for nearly all stations, less than the middle stratum, and only about the same as the lower (10-25 m.). It is perhaps true that the upper and the lower vary in accord with each other in general; their variations are apparently independent of the depth or other factors at hand. There is an interesting parallelism in the lines representing the surface stratum and that from 5 to 10 meters; but for this no cause can be assigned as yet. Only one of these lines is above the zero line of the plate, that is, indicates a quantity of plankton less than nothing! It is the 2-5 m. line at the shallowest station, where this is the bottom stratum. The apparent absurdity of a quantity of plankton with the minus sign is one of the minor disadvantages of the subtraction method; it is possible only when the minimum amount of plankton in a given stratum is less than the possible fluctuations in the amount of plankton contained in the superjacent water, and it indicates that the amount probably present in the stratum was insignificant.

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* The last two points are not shown on the plates given in this article.

The lines denoting the intermediate strata lie in all cases clearly below the lines of the deep strata, 50-25 m., and bottom—50 m.; the latter never equal to the former and in a large per cent of cases the amount of plankton seems to be a negative quantity. This is indicated by the position of the 25-50 m. line above the zero horizontal at IX., XIII., and XVIII. In the case of the deepest stratum, which was present in but two instances, the amount of plankton obtained was even more insignificant. The deep strata are practically without plankton so far as our observation extended.

One question in the distribution of life in these waters which was not studied, is the possible existence of a deep fauna, not strictly planktonic in character, but dependent in fact upon the bottom, where it rests and reproduces, and frequently making short excursions into the superjacent water. It would thus be dependent for support on the plankton and would frequently be collected with the latter, but would be no proper portion of it.

If this be in rough outline the distribution of the plankton as a whole, it will be seen at a glance that this is merely the beginning of the problem. The distribution of the whole is no more than the sum of the distributions of its many species. In so far as the variations in the volume of the different strata, so clearly marked on the maps, are not produced by errors in apparatus and method, they are due, no doubt, to fluctuations in the location of certain species. Such changes are known to be brought about in isolated instances by change in temperature and light; how far these influences are operative in carrying an unknown species from one side to the other of the artificial limits we have placed in the water, and in thus modifying the qualitative and quantitative composition of the plankton in any particular stratum—these are but suggestions of the many questions awaiting a solution.

The investigation of plankton problems has only just begun; yet hand in hand with these studies goes the practical application of the results obtained. It would be impracticable to explain here the light that they throw on the probable life of the young fish and the precautions to be observed in planting the fry; the subject must be left with the mere hint. Already efforts have been made on a small scale at least to increase the primitive food supply, and in some small fish ponds in Europe it has met with moderate success. No one can predict the possibilities of the future; these studies have made one of its necessities evident and imperative. Aquaculture must be given the same sort of broad, scientific treatment that agriculture already receives; it must be studied from the scientific standpoint, its problems analyzed, its course marked out with definiteness. Not until then can it hope to render that service to the people which the unequalled opportunity of our inland seas makes possible in the way of a permanent supply of food at once cheap and agreeable.

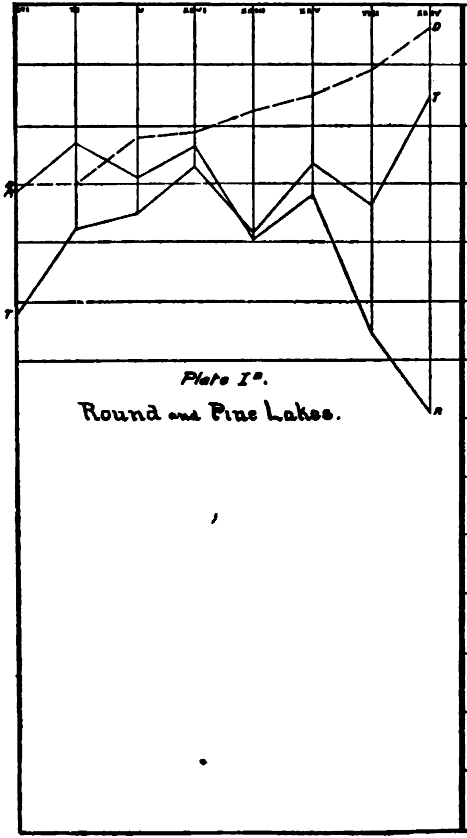


Plate I^b.

Round and Pine Lakes.

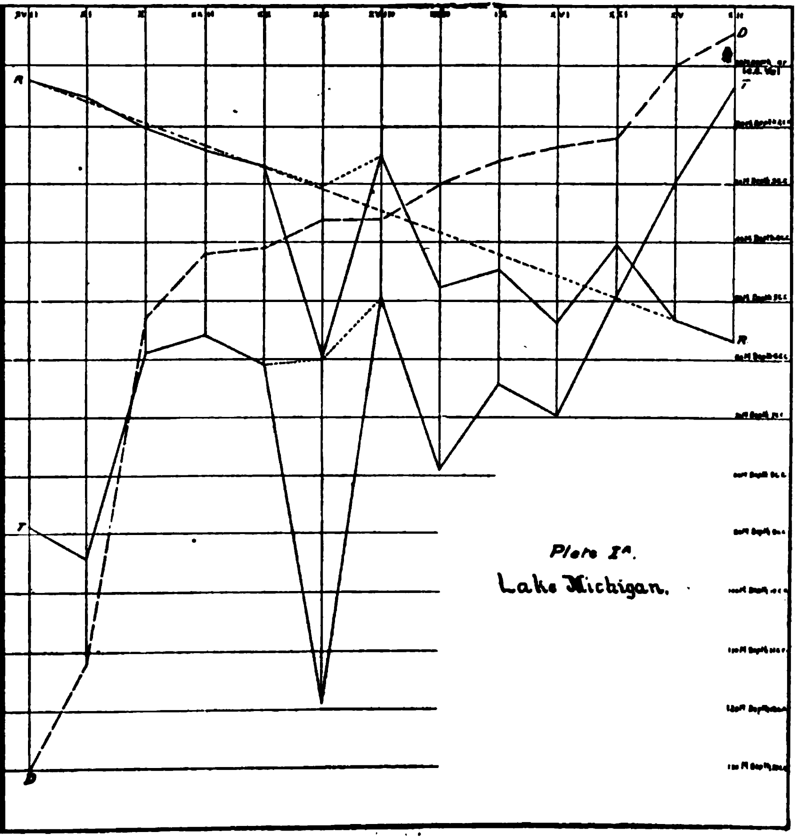


Plate I^a.

Lake Michigan.

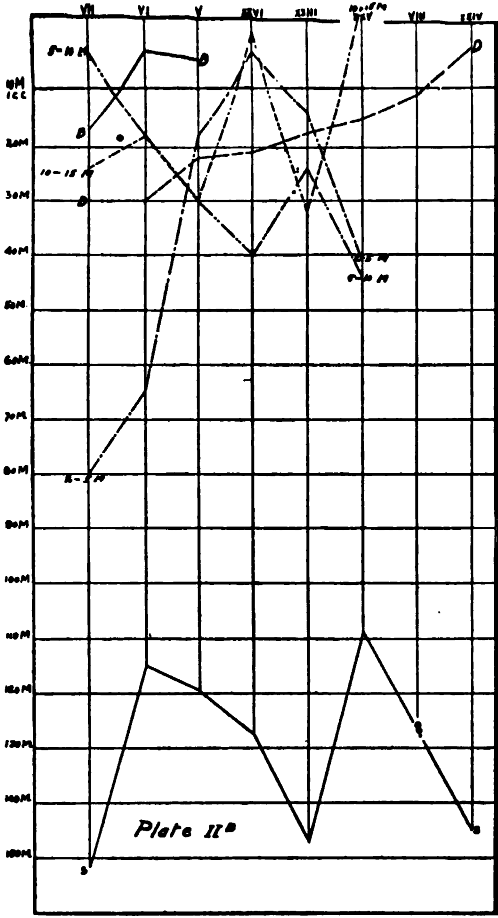


Plate IIB

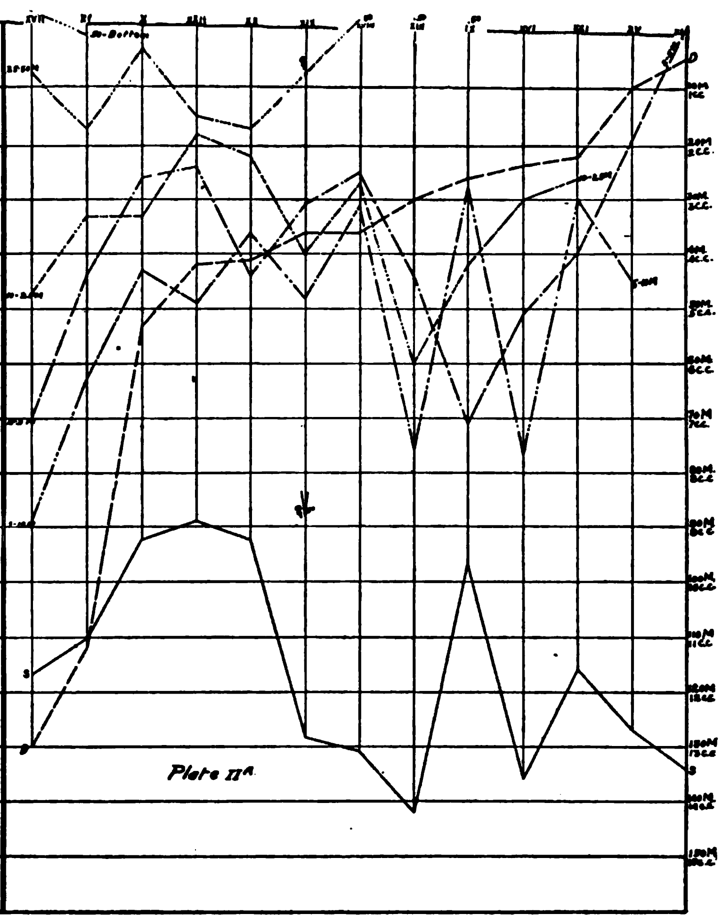


Plate IIA

FISH PRESERVATION AND FISH CULTURE IN NORTH AMERICA.

EXTRACTS FROM MR. OSCAR NORDQVIST'S OFFICIAL REPORT TO THE IMPERIAL SENATE OF FINLAND.

After a week's stay in Put-in-Bay, I went to Detroit, Michigan, the headquarters of the Michigan State Fish Commission. The city is situated on the river forming the connection between Lakes Huron and Erie, and has an extensive hatchery here for hatching whitefish and pike perch, which is the largest institution of the kind in the world. Over one hundred millions of young whitefish are turned out there in one year.

In Detroit I made the acquaintance of the energetic Fish Commissioner of Michigan, Mr. Herschel Whitaker, who gave me valuable and manifold information about the work of the commission, and especially the cultivating of fish, including literature, photographs, etc.

On my way to Paris I also visited the State Commission's station for the gathering of pike perch spawn at Saginaw Bay, on the shore of Lake Huron. Owing to stormy weather just then prevailing, the fishermen could not show me the manipulation of the weirs and the other tackle, but I witnessed and took practical part in the artificial impregnation of pike perch spawn from fish kept there for this spawning purpose. I also observed a process to prevent the eggs from adhering by adding starch to the spawn after a method invented by Prof. Reighard, by which the results of impregnation are considerably increased.

In parts of the United States yearly statistics of fishermen are gathered and published. In the State of Michigan every person pursuing the vocation of a fisherman on the Great Lakes is bound to furnish a report every year by filling out blanks which the commission has prepared for the purpose. As this provision, however, does not naturally prevent negligence on the part of fishermen, the State Fish Commission employs a special agent whose duty it is to visit the fishermen and enforce the statutes of the fish laws regarding these reports as required. Furthermore the agent is to gather information with all possible exactness about the important and precise places frequented by the different kind of fish as spawning beds; whether the conditions of fishing are improving or declining in particular localities; the fishermen's opinions as to the cause of respective changes; whether the water has been polluted by offal from factories or similar refuse, and if so, the resulting extent of injury to the fishery; what propositions or recommendations with reference to an improvement of conditions the fishermen might make; in what way and for what period they would recommend a closed season for whitefish; whether artificial propagation helped the fisheries and if so, by what means such fact had been ascertained; whether there should be any restrictions as to the size of nets or meshes; and finally, whether persons conducting fishing on a large scale would be willing and able to attend conferences for the promotion of the interests of the fisheries.

In the year 1893 the Michigan Fish Commission established a biological station in Lake St. Clair for special scientific research pertaining to the improvement of fisheries and fish culture. This institution is superintended by Prof. J. E. Reighard, whose endeavors were hitherto mainly devoted to the alimentary resources for fish in Lake St. Clair.

In connection with this scientific work I will also mention the systematic researches of the Fish Commission concerning the results of fish culture in the State of Michigan. For this purpose the commission keeps special employés. Their duty consists in investigating the lakes as to dimensions and depth, the conditions of bottoms and banks, of inlets and outlets, the temperature of the surface and ground water and the kind of fish that frequent it. These data, together with notes on the weather, the exact time of investigation and the tackle used during the researches after the different kinds of fish, etc., are entered on printed blanks, which contain also a special column for remarks about the most desirable species for stocking purposes.

In many thousand streams where there were no brook trout it is now acclimated, thanks to the work of cultivation. Take the State of Michigan, for instance; there the following number of brook trout fry has been hatched between 1883 and 1892:

1883	269,000
1884	383,000
1885	408,000
1886	719,000
1887	1,090,000
1888	1,639,000
1889	2,468,000
1890	2,578,000
1891	2,500,000
1892	2,252,000

The Michigan Fish Commission plants the young brook trout at the time of absorption of the yolk sac.

This work of cultivation produced very satisfactory results. Previous to it brook trout were very scarce and only occasionally met with in a few streams of the lower peninsula; now it affords good angling in two-thirds of all the counties of the entire State.

The State fish laws absolutely forbid the catching of brook trout in any water artificially stocked with it by the State Commission within three years from the date of stocking. The enforcement of this law brought it about that between the 1st of May of 1890 and 1892 700 streams stocked by the commission were opened to the catching of brook trout. Altogether there are about 2,000 streams open now for brook trout catching where this fish had been artificially introduced.

Of all the fish subjected to the experiment none has been cultivated on such a large scale as the whitefish on account of its great economical importance surpassing that of any other fresh water fish.

Among the several varieties of whitefish found in American waters, the common whitefish (*coregonus clupeiformis*) and the lake herring (*coregonus artedi*) are by reason of their abundance the most important for economical purposes, the former taking precedence over the latter. That will account for the fact that until recently the common whitefish constituted the almost exclusive object for cultivation. Both varieties are taken in the Great Lakes and in Canada, although the northern boundary line of their habitat has not as yet been ascertained.

This work found a powerful support with the Michigan State Fish Commission, whose whitefish and pike perch hatchery in Detroit is the largest of its kind on the entire globe.

The states of Pennsylvania, Ohio and New York contributed their share likewise in helping the propagation of whitefish by planting millions of fry every year.

Next to the United States and the Michigan State Fish Commissions as to the importance and magnitude of the work done, ranks the Department of Fisheries of the Canadian Government. In 1891 the department planted 451,380,000 whitefish fry.

As not all of the reports of the different states were accessible to me, I find it impossible to state the exact amount of whitefish fry hatched and planted on and in the Great Lakes. The approximate estimate of the combined output of the United States and Canada in distributed young whitefish should, in my opinion, be placed at about two milliards.

The Michigan State Fish Commission started pike perch culture in its own hatchery in 1887; the output has steadily increased ever since as shown by the following table:

1887	3,280,000 fry.
1888	11,492,000 fry.
1889	44,340,000 fry.
1890	22,300,000 fry.
1891	27,045,000 fry.

At the meeting of the American Fisheries Society in Chicago in 1893, Prof. Reighard related an experiment undertaken at the request of the Michigan State Fish Commission for the purpose of finding a suitable means to prevent the cleaving (adhesion) of pike perch eggs. The Professor pointed out the following ways as suggesting themselves upon the experimenter:

1. Some substance might be found which after being dissolved in the water over the spawn would destroy the tendency to adhere of the outer membrane of the eggs without injuring the ova or milt. Different substances were tried but with poor results.

2. The eggs may be allowed to adhere so as to form clusters, and may afterwards be separated by mechanical means as, for instance, by letting them pass through a sieve. The eggs, however, through the pressure against each other, will change their shape and some of them will be destroyed.

3. Some substance may be introduced in the water which will penetrate the spawn in such a manner as to prevent the eggs from touching each other. After trying numerous substances in vain, Prof. Reighard obtained good results by using corn starch.

One part of starch was mixed with 20 parts of water. The eggs were impregnated in the usual way; after two to three minutes they are immersed in the starch solution until the latter is half filled with spawn. The eggs sink to the bottom of the receptacle and become covered with the starch which prevents their cleaving together. Thus they are allowed to remain undisturbed and the injurious effect of moving is avoided. After having been immersed for a while in the solution, they are suddenly transferred into an abundance of clear water; the milt is almost instantly washed off and the surface of the eggs thus cleaned from adhering alkaloids.

The starch sinks gradually; within ten minutes most of it is deposited on the bottom of the vessel. The water is then replaced by fresh water; by shaking or swinging the vessel, starch and eggs are mixed with the fresh water. After the starch has settled again a new fresh water change may be effected. In this way the water may be renewed every ten minutes, if deemed necessary, and without adding new starch. The eggs may remain in the starch solution for four hours or more, but usually they were washed clean after two hours. After that they appeared well filled and of normal form, and when transferred to fresh water they did not stick.

The starch seems to have no influence other than to prevent the eggs from cleaving. Eggs treated after this manner showed an increase in impregnation of from 15 to 30 per cent, compared with the old method. Mr. Dwight Lydell of the Michigan Fish Commission, who carried on these experiments, on a large scale, showed that this application of corn starch increased impregnation of pike perch eggs by about 20 per cent.

Prof. Reighard's process must be greeted as a valuable discovery of special importance in fish impregnation, in fact as the only important one since the discovery of dry fish impregnation by the Russian fish cultivator, Wrassky, which is now in use nearly throughout the entire world.

After the experiments in cultivating living food, undertaken successfully by a few European hatcheries, the Americans began to follow in their wake during the last few years. But whoever had had the occasion to observe the vigor and perseverance shown by the Americans in the work of fish cultivation, must certainly feel convinced, that within a short time they will also be masters in this new branch and will develop and complete new methods.

Methinks I could not do better in rendering my concluding impressions than to quote from the 10th Annual Report of the Michigan State Fish Commission the following:

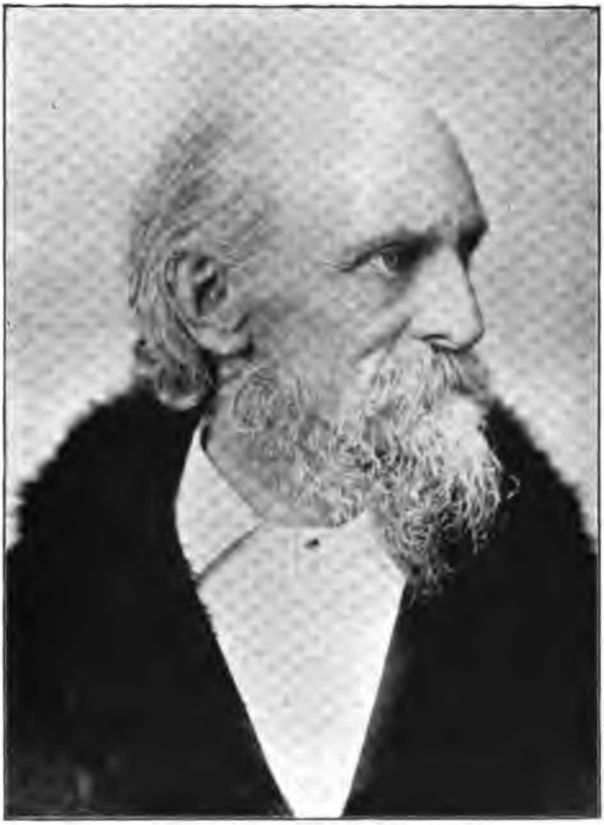
"Considering that the first successful attempts at fish cultivation " have occurred within a lapse of time still remembered by many living " persons, the progress made and the results obtained may indeed appear " as next to marvellous."

OSCAR NORDQVIST,
Helsingfors, Finland.

October 1895.

ANDREW J. KELLOGG, COMMISSIONER.
1874 TO 1884.

ELI R. MILLER, COMMISSIONER.
1875 TO 1883.



J. C. PARKER, COMMISSIONER.
1877 TO 1893.

JOHN H. BISSELL, Commissioner.
1883 to 1889.

HOYT POST, COMMISSIONER.
1889 TO 1895.

Bulletin of the Michigan Fish Commission

No. 5.

ON THE

CYCLOPIDÆ AND CALANIDÆ OF LAKE ST. CLAIR,
LAKE MICHIGAN, AND CERTAIN OF THE INLAND LAKES OF MICHIGAN.

BY C. DWIGHT MARSH,
PROFESSOR OF BIOLOGY IN RIPON COLLEGE.

RESULTS OF A BIOLOGICAL EXAMINATION OF LAKE ST. CLAIR UNDERTAKEN FOR THE STATE BOARD OF
FISH COMMISSIONERS IN THE SUMMER OF 1893 UNDER THE SUPERVISION OF J. E. REIGHARD,
AND OF SIMILAR WORK IN THE SUMMER OF 1894, IN THE VICINITY OF CHARLEVOIX
UNDER THE SUPERVISION OF H. B. WARD.

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1895.

ON THE CYCLOPIDÆ AND CALANIDÆ OF LAKE ST. CLAIR, LAKE MICHIGAN, AND CERTAIN OF THE INLAND LAKES OF MICHIGAN.

From the standpoint of the pisciculturist, perhaps no class of animals outside the fishes themselves is so important and interesting as the entomostraca. It is a well known fact that these minute crustacea form the entire food material of the young of some of our most important food fishes, and in many cases form a large part of the food of the adults.

They are universally distributed. Every stream, lake, pond, and pool has its population of these minute creatures. Moreover they are present in some places in enormous numbers. In the deeper waters of our lakes the surface waters to a depth of about thirty feet fairly swarm with copepods. In limnetic collections there are always present some *Cladocera*, but the great bulk of the material in any lake will consist of two or three species of *Diaptomus* and as many of *Cyclops*.

Inasmuch as the occurrence and abundance of animals is largely dependent on their food supply, it will be seen that an accurate and thorough knowledge of entomostraca is of fundamental importance, if we would have an exact knowledge of the conditions controlling our fish.

The material on which this paper is based was obtained from the following sources.

1. Collections made by Professor Reighard in certain lakes in southern Michigan in the summers of 1891 and 1893.
2. Collections made by Professor Reighard in the northern part of Lake Michigan in the spring of 1893.
3. Collections made by Professor Reighard during the biological examination of Lake St. Clair in the summer of 1893. This involved a very large number of collections in the months of July and August, and its results probably give us a very accurate knowledge of the copepod fauna of Lake St. Clair in the summer season. In connection with this work a few collections were also made in the Detroit river and in Lake Erie.
4. Collections made in July and August 1894 in connection with the scientific work of the Michigan Fish Commission at Charlevoix. This involved a careful examination of Round Lake and Pine Lake, collections in Lake Michigan and the lakes on Beaver Island, and cursory examinations of the small lakes in the neighborhood of Charlevoix.

5. Collections made by Dr. R. H. Ward in September, 1894, in Emmet and Cheboygan Counties, along the "Inland Route."

Inasmuch as these collections were made for the most part, in the summer season, and more especial attention was paid to the larger bodies of water, the results of the examination cannot be considered as giving us a complete knowledge of the fauna of the State. A more careful examination of the smaller lakes and of the stagnant pools would doubtless add some species to the list. Yet the number of those species would be small, and for the larger bodies of water the list as given in this paper is probably very nearly complete.

This becomes evident when one remembers how nearly identical are the faunæ of the deeper waters of our lakes. To such an extent is this true that one can prophesy quite exactly what species will be found in a collection from any of the lakes of this latitude. The collections from the deeper water will almost invariably give the following species:—*Diaptomus oregonensis*, *Cyclops brevispinosus*, *C. Leuckarti and C. fluviatilis*. *C. albidus* and *C. serrulatus* may be present, but belong more properly to the littoral fauna. In the larger lakes, in addition to this list we may find *Epischura lacustris*. *Diaptomus sicilis*, *D. Ashlandi*, *D. minutus*, and *Limnocalanus macrurus* are not commonly found except in the Great Lakes and in the bodies of water in direct connection with them; in the Great Lakes, too, *C. pulchellus* takes the place which *C. brevispinosus* holds in the smaller lakes.

D. Reighardi is the only new species which I have found in the Michigan collections. As I have already remarked in a former paper ('93 p. 192) the species of *Diaptomus* are, in some cases, quite limited in their distribution, and apparently *Diaptomus* is much more susceptible to the influences of its environment than is *Cyclops*. Very little is known of the life histories of the species of *Diaptomus*, and it is possible that a more complete knowledge may lead to a reduction of the number of species. But, so far as I can see, all the forms described vary within comparatively narrow limits, and there is no evidence whatever to lead us to question the separation of the forms.

I have indicated, in the accompanying chart, the distribution of the species. It has not seemed necessary to indicate the character of the individual collections in Lake St. Clair and Lake Michigan as no particular significance is attached to such facts.

The sketch maps will show most of the localities where the collections were made.

It is interesting to note the greater richness of the copepod faunæ of our lakes as compared with those of the continent of Europe. Zacharias finds seven species of copepods belonging to the *Cyclopidæ* and *Calanidæ* in the Plöner See. In Lake Michigan there are nine, and that includes no littoral species; in the lakes on the Beaver Island there are eight, in Pine Lake nine, in Round Lake eleven, in Intermediate Lake eleven, and in Lake St. Clair sixteen. The large number in Lake St. Clair is probably explained by the fact that, being very shallow, it has the species of the smaller bodies of water and of the stagnant pools, and in addition, because of its connection with the Great Lakes, has also their limnetic species.

Table of occurrence of Cyclopidæ and Calanidæ.

	Lake near Baldwin.	Bear Lake, Charlevoix County.	Beaver Island, North Lake.	Beaver Island, South Lake.	Black or Round Lake, Emmet County.	Burt Lake, Cheboygan County.	Carp Lake, Emmet County.	Crooked Lake, Emmet County.	Detroit River.	Dodge Creek, Cheboygan County.	Lake Erie.	Indian River, Cheboygan County.	Intermediate Lake, Antrim County.	Long Lake, Genesee County.	Long Lake, Ionia County.	Lake Michigan.	Mullet Lake, Cheboygan County.	Pickerel Lake, Emmet County.	Pigeon River, Cheboygan County.	Pine Lake, Charlevoix County.	Round Lake, Charlevoix County.	Lake St. Clair.	Susan Lake.	Twenty-sixth Lake.	Twin Lakes, Charlevoix County.
Diaptomus sicilis									+							+				+		+			
" Ashlandi									+							+				+	+	+			
" minutus		+				+		+	+			+				+	+			+	+	+			
" Reighardi			+					+					+												
" oregonensis		+		+		+		+			+	+	+	+	+	+	+	+		+	+	+		+	+
Epischura lacustris		+		+			+	+			+	+		+	+	+	+			+	+	+			
Limnocalanus macrurus									+							+						+			
Cyclops ater													+								+	+	+	+	
" brevispinosus	+	+	+	+	+		+	+	+		+		+					+			+	+	+		
" pulchellus						+			+		+	+				+				+	+	+			
" parcus																						+			
" Leuckarti		+		+	+	+	+	+			+	+	+		+	+	+	+		+	+	+			+
" fuscus													+												
" albidus			+	+	+		+			+			+					+	+		+	+	+	+	+
" fluviatilis		+		+		+	+	+			+		+		+	+	+			+	+	+		+	+
" serrulatus	+	+	+	+	+		+	+	+	+		+	+					+	+		+	+	+	+	+
" phaleratus													+						+			+		+	
" bicolor				+									+									+			

Pine Lake is peculiarly poor in its number of species. This is strikingly apparent when we compare it with Intermediate Lake. Pine Lake was very thoroughly examined, and it is likely that we are acquainted with all the species occurring there, and yet the number is only eight. All the collections from Intermediate Lake were made in one day by a party which went down from Charlevoix and remained only a few hours, and yet the number of different forms is eleven. Intermediate Lake seems to be an unusually rich collecting ground, for with the exception of Lake St. Clair and Round Lake, no other lake shows such a large number of species, and both Lake St. Clair and Round Lake have been very thoroughly explored. Moreover, in the case of Round Lake, several of the species may be considered as immigrants from Lake Michigan.

In general it may be said that the copepod fauna of Michigan does not differ materially from that of Wisconsin, which I have already described in a former report. (Marsh '93.) This is only what one would expect because of the very wide distribution of the species, as already noted. (Marsh '93, p. 191.)

Inasmuch as many of the species have been imperfectly described, it has seemed best to me in preparing this paper to devote some space to more detailed descriptions, and particularly to furnish some figures in addition to those already published, and in this way to supplement the work of preceding papers.

The literature of the *Copepoda* is so scattered that it is very difficult for any one except a specialist to make determinations of species that are at all satisfactory. Without doubt this fact has deterred many from attempting any study of the *Copepoda*. Much valuable work in regard to the distribution of species might be done by amateur investigators if there were any work giving brief directions by which the species might be determined with a fair degree of accuracy. This lack, with the advice of Professor Reighard, I have attempted to supply in the present paper. Preceding the notes on *Diaptomus* and *Cyclops*, I have given a brief synopsis of the species of those genera. These synopses, which, with some modifications, are like those in my paper on the copepods of Wisconsin, are intended simply to furnish a means of recognizing the species by some of their most obvious characters. While the first six plates may be considered as supplementing the work of my Wisconsin paper, I have thought best, in order to aid in the identification of species to add the seventh, which repeats some of the figures of the former paper. I think that by means of the synopses and plates, any one who has the patience to make the necessary dissections, will be able without much difficulty to identify our species of *Cyclops* and *Diaptomus*, at least as far as adult forms are concerned.

I have included in the synopses some species which have not yet been found in Michigan, but which have been reported from Wisconsin, and will, doubtless, after a more thorough exploration, be included in the Michigan fauna.

FAMILY CALANIDÆ.—Genus DIAPTOMUS Westwood.

KEY TO SPECIES OF DIAPTOMUS FROM CHARACTERISTICS OF THE MALE.

Antepenultimate joint of antenna without appendage,
  Fifth feet nearly equal in length, ---------------------- *oregonensis.*
  Left fifth foot shorter than right,
    Inner ramus of left fifth foot about equal in length to first joint of outer ramus, terminal hook of right foot not markedly angular, -------------------------- *pallidus.*
    Inner ramus of left fifth foot about twice as long as first joint of outer ramus, terminal hook of right foot with an abrupt angle at about midway of its length, *Reighardi.*
Antepenultimate joint of antenna with hyaline lamella, ---- *leptopus.*
Antepenultimate joint of antenna with appendage,
  Appendage short and blunt,
    Left fifth foot hardly reaching end of basal joint of right, lateral spine of terminal joint of right foot weak, reaching about to end of joint, species large, occurring only in spring, ------------------------- *sanguineus.*
    Left fifth foot reaching to about one-third the length of the terminal joint of the right, lateral spine of terminal joint large, reaching to nearly one-half the length of the terminal hook, ---------------------- *Birgei.*
  Appendage as long or longer than the penultimate joint,
    Terminal hook of right fifth foot broad, lateral spine minute, ---- ------------------------------------- *minutus.*
    Terminal hook falciform,
      Lateral spine nearer outer extremity of joint, ------- *sicilis.*
      Lateral spine stout, nearer base of joint, ------------ *Ashlandi.*

Diaptomus sicilis Forbes.

Plate VII, figs. 1 and 11.

1882.	*D. sicilis*	Forbes, p. 645, pl. VIII, figs. 9 and 20.
1884.	" "	Herrick, p. 142, pl. Q, fig. 18.
1889.	" "	DeGuerne and Richard, p. 23, figs. 13 and 14, pl. II, fig. 13.
1891.	" "	Forbes, p. 702, pl. 1, fig. 6.
1893.	" "	Marsh, p. 197, pl. III, figs. 8 and 10.

D. sicilis is found everywhere in the Great Lakes, in Lake St. Clair and in the Detroit River. It is also found in Pine Lake, and very likely occurs in other bodies of water having direct connection with the Great Lakes.

I do not know of its occurrence in bodies of water away from the Great Lakes, except in Green Lake (Marsh '91 and '93), and Lake Geneva (Forbes, '90), and both of these are deep-water lakes.

Diaptomus Ashlandi Marsh.

Plate VII, fig. 2.

1893. *D. Ashlandi* Marsh, p. 198, pl. III, figs. 11–13.

When I described this species in my paper on the *Cyclopidæ* and *Calanidæ* of Wisconsin, I knew of only two localities for it, Lake Superior and Lake Erie. It occurred in the collections from Lake St. Clair and the Detroit River, but not abundantly. In the Lake Michigan collections it was a common species, but not nearly so numerous as *D. minutus*. I found it in none of the smaller lakes except Round Lake and Pine Lake.

DIAPTOMUS MINUTUS Lilljeborg.

Plate VII, fig 3.

1889. *D. minutus* DeGuerne and Richard, (Lilljeborg) p. 50, pl. I, figs. 5, 6 and 14, pl. III, fig. 25.
1891. *D. sicilis var. imperfectus* Forbes, p. 703.
1891. " " Marsh, p. 212.
1893. " " Marsh, p. 199, pl. IV, figs. 1 to 3.

D. minutus is, perhaps, the most common of all the *Diaptomi* in the collections from Lake St. Clair and the Great Lakes. With *D. sicilis* and *D. Ashlandi* it forms the great bulk of the crustacea in the limnetic collections. While I have found it in one or two of the Wisconsin lakes, it, like the two preceding species, has not so far been found in any of the Michigan waters which do not have direct connection with the Great Lakes. The three species may be fairly considered as characteristic of the fauna of the Great Lakes.

It is with considerable hesitation that I have considered Forbes's *imperfectus* identical with *minutus*. One can not be certain of the identity of the two forms from the description given by Forbes, and yet from the localities which he gives for his variety, it seems very probable that the two are the same. He speaks of it as common in Lake Superior and Lake Michigan, and in some adjacent lakes, and in Lake Geneva. Inasmuch as *D. minutus* is so common in the Great Lakes it is not at all probable that it has been overlooked by so accurate an observer as Professor Forbes, and as he reports *imperfectus* as an abundant form, I think the probabilities are that *imperfectus* is a synonym of *minutus*.

DIAPTOMUS OREGONENSIS Lilljeborg.

Plate VII, fig. 5.

1889. *D. oregonensis* DeGuerne and Richard, (Lillj.) pl. II, fig. 5, pl. III, fig. 8.
1893. " " Marsh, p. 200, pl. IV, figs. 4 and 5.

D. oregonensis is the common limnetic species of the smaller lakes. It occurs in the Great Lakes, but not abundantly, while in the smaller bodies of water it usually forms the larger part of the limnetic fauna.

DIAPTOMUS REIGHARDI, *sp. nov.*

Plate I, figs. 1-4.

The first segment of the cephalothorax is considerably shorter than the second. The first two segments form nearly half the length of the cephalothorax. The last segment is armed behind with two very minute spines.

The first segment of the abdomen of the female is elongated, nearly equal in length to the remainder of the abdomen and the furca. It is dilated laterally and in front and bears two rather small lateral spines. The second segment is about one-third shorter than the third. The third segment is slightly shorter than the furca.

The antennae reach the end of the furca. The right antenna of the male is swollen anterior to the geniculating joint; the antepenultimate joint has no appendage.

The outer ramus of the fifth foot of the female is two-jointed. The third joint is represented by the customary two spines. The inner ramus is one-jointed; it is somewhat longer than the first joint of the outer ramus, and is armed at tip with minute setæ and two spines.

In the right fifth foot of the male the basal joint is quadrangular, about one-half longer than broad. The length of the first joint of the outer ramus is about equal to its width. The second joint is elongate, concave on its inner margin; at about one-third of its length there is a minute spine on its inner margin; the rather long lateral spine is situated at about two thirds of its length. The terminal hook has a single abrupt angle at about one-half its length. The inner ramus is one-jointed and equals in length the first joint of the outer ramus.

The left fifth foot of the male reaches a little beyond the middle of the second joint of the outer ramus. The basal joint is about as broad as long, and is somewhat shorter than the basal joint of the right foot. The first joint of the outer ramus is about as broad as long, its distal end considerably narrower than the proximal. The second joint is about twice as long as the first, and the tip is expanded into two finger-like processes, of which the outer is much the larger and is armed on its inner surface with a pad bearing minute setæ. The inner ramus extends to rather less than one-half the length of the second joint of the outer ramus.

Length of female, 1.1395 mm.; male, 1.0248 mm.

This species, which is nearly related to *D. oregonensis*, is yet readily distinguished by the characters of the male fifth foot. I found it in the collections from only three localities,—the North Lake on Beaver Island, Intermediate Lake, and Crooked Lake.

I have named this species in honor of Professor Reighard who has, directly and indirectly, done so much to increase our knowledge of lacustrine faunæ.

GENUS EPISCHURA FORBES.

Plate II, figs. 1-6. Plate III, figs. 1-6.

EPISCHURA LACUSTRIS Forbes.

1844. *Scopiophora vagans* Pickering, p. 62.
1882. *E. lacustris* Forbes, pp. 541 and 648, pl. VIII, figs. 15, 16, 21, 23, pl. IX, fig. 8.
1884. *E. lacustris* Herrick, p. 131, pl. Q, fig. 13.
1889. " " DeGuerne and Richard, p. 90, pl. IV, figs. 3, 9 and 10.
1891. " " Forbes, p. 704, pl. I, figs. 1-5; pl. II, fig. 7.
1893. " " Marsh, p. 200, pl. IV, fig. 6.

I have very little doubt that, as stated by Herrick ('84, p. 131), the *Scopiophora vagans* of Pickering is the same as *E. lacustris.* The statement in regard to the armature of the abdominal furcæ can apply to no other genus, and as only one species of *Epischura* has been found in the Great Lakes, there would seem to be little doubt as to the identity of Pickering's species. If then we follow the laws of priority as strictly as do some authors, we should throw out Forbes's name. But I cannot think it wise when a name has been so long incorporated in our literature, and is founded on an accurate and easily recognized description, to throw it aside in favor of a name accompanied by a description which, it is true, probably applies to this animal, but is manifestly inaccurate in some particulars, and may be in all.

It is not necessary to give a detailed description of this species, as that has already been done by other authors, but, as very few figures of it have been published, it has seemed best to me to draw quite a number in order that they may serve for comparison of this genus with others, and of the various species of *Epischura* with each other.

A few points in the anatomy, which have not been noted by others should be mentioned.

Forbes has recently ('93, p. 255) called attention to the fact that the fourth abdominal segment of the male is without a process, and that the fifth bears two processes.

The antennæ are 25-jointed. In the female, clavate sensory setæ are present on all segments except the 4th, 6th, 8th, 10th, 20th, 21st, 22d and 24th. The 8th and 11th segments have each a short spine. The left antenna of the male is like those of the female except that the sensory setæ are much longer, particularly on the basal segments. The right antenna of the male is 22-jointed, with a hinge between the 18th and 19th segments. The 19th segment is formed by the union of the 19th, 20th and 21st of the typical antenna, and the 20th by the union of the 22d and 23d.

The outer rami of the swimming feet are three-jointed, and the inner one-jointed. In all the feet the inner ramus bears five setæ In the first foot the first and second joints of the outer ramus have each one external and one internal seta. The terminal joint has six setæ. In the second, third, and fourth feet, the first and second joints of the outer ramus have spines externally instead of setæ as in the first foot. The terminal joint has two short spines externally, a long terminal spine with its outer margin deeply serrate, and four setæ on the internal margin.

E. lacustris was a common species in the collections from Lake St. Clair, Lake Michigan, and many of the smaller lakes.

GENUS LIMNOCALANUS SARS.

LIMNOCALANUS MACRURUS Sars.

Plate IV, figs. 1 and 2, Plate V, figs. 1-5.

1863. *L. macrurus* Sars., pp. 228-229.
1882. " " Forbes, p. 648.
1886. *Centropages Grimaldi* DeGuerne, pp. 1–10.
1888. *L. macrurus* Nordqvist, pp. 31–37, pl. I, figs. 9–11; pl. II, figs. 1–5; pl. III, figs. 1–4.
1889. *L. macrurus* DeGuerne and Richard, p. 77, pl. IV, figs. 5, 11, and 12.
1891. *L. macrurus* var. *auctus* Forbes, p. 706.
1893. " " Marsh, p. 201, pl. IV, fig. 7.

For the description of *L. macrurus* we must depend largely upon the elaborate description and figures of Nordqvist.

Forbes ('91, p. 706) thinks that our form is sufficiently different from the European to rank as a distinct variety. When preparing my former paper ('93) it did not seem to me that there was good reason for establishing a new variety. Recently I have made a more careful examination of the details of its structure, using material from Detroit River, Lake Michigan, and Green Lake. So far as the specimens I have examined are concerned, the points of difference mentioned by Forbes ('91, p. 707) do not exist. It seems to me that the twenty-fifth antennal segment is clearly separated from the twenty-fourth, and not consolidated as stated by him. In all my specimens I find the hook like spines on the eighth and twelfth segments.

Nordqvist and Forbes are in agreement in regard to the terminal teeth of the mandible, but Forbes finds one seta instead of the two figured by Nordqvist; in this respect my observations confirm those of Forbes. The accessory spines have been evident in my preparations. It would seem then, that unless *L. macrurus* is susceptible of local variations—a highly improbable supposition—that Forbes's variety can not stand, for the only point of difference on which it rests is the existence of one seta on the mandible instead of two.

The second joint of the second maxillipede differs slightly from Nordqvist's figure, and I have accordingly figured it. (Pl. V, fig. 5.) The difference appears to me, however, unimportant.

It is impossible to tell whether our species may not differ from the European in the armature of the antenna, as that was not worked out in detail by Nordqvist. In regard to the sensory setæ, he simply states that they are present on some of the segments, but does not state their number.

In the female, clavate sensory setæ are present on all joints except the 4th, 20th, 21st, 22d, and 24th. The setæ are distributed as follows: the first joint has three; there are two on the 2d, 3d, 5th, 7th, 9th, 10th, 11th 13th to 19th inclusive, and 22d to 24th inclusive; the 4th, 8th, 12th 20th, and 21st have one seta; the 6th has none; the 25th has four setæ, one of which is plumose; the 8th and 12th have, in addition to the ordinary and sensory setæ a hook-like spine.

The left antenna of the male is armed like the female antenna.

The right antenna of the male is 22-jointed, the 19-21 being united in one, and the 22d and 23d. The joint is between the 18th and 19th. The side of the 17th is produced into a blunt spine, and the 18th and 19th are armed on the inner margin with rows of minute spines. The number of the sensory setæ is the same as in the left antenna and in the antenna of the female, and not greater as stated by Nordqvist. In fact the differences in the armature of the right and left antennæ are only apparent, and are occasioned by the coalescence of the 19th–21st and the 22d and 23d joints.

It has seemed best to me to figure the swimming feet and describe them in some detail, in order to get a basis of comparison with similar forms.

In the first foot both the first and second basal joints are armed internally with a plumose seta. The first two joints of the exopodite have no external spines; the terminal joint has two external spines, two apical setæ—the outer spinulose on its outer margin—and three internal setæ. The terminal joint of the endopodite has one internal seta, two apical, and three internal.

The second, third and fourth feet have no seta on the second basal joint, and the first and second joints of the exopodite have each an external spine. In all the feet except the first there are groups of two or three minute spines at the bases of the spines of the exopodite.

The second and third feet are alike. The terminal joint of the exopodite has four internal setæ, and the terminal joint of the endopodite has two external setæ and four internal.

The fourth foot is like the second and third except that the terminal joint of the endopodite has three internal setæ. The fifth feet have no setæ on the basal joints. The second joint of the exopodite in the female is prolonged internally into a hook-like expansion. The exopodites of the male are two jointed, the terminal joints having a peculiar construction more easily understood from the figure than from any written description. The terminal joints of the endopodite in both male and female are armed with two external, two apical, and two internal setæ.

FAMILY CYCLOPIDÆ.—Genus CYCLOPS Müller.

KEY TO SPECIES OF CYCLOPS.

- Antennæ 17-jointed,
  - Fifth foot one-jointed, armed with one spine and two long setæ—a large species of dark color, ... *ater.*
  - Fifth foot two-jointed,
    - Second joint of fifth foot armed with seta and short spine,
      - Terminal joint of outer branch of swimming feet armed externally with three spines,
        - Furca of moderate length—occurring in pools, ... *Americanus.*
        - Furca elongated, outer furcal seta abbreviated to a short, thick spine—limnetic in habit, ...*brevispinosus.*

Terminal joint of outer ramus of swimming feet armed externally with two spines, ---------------- *parcus.*
Second joint of fifth foot with two terminal setæ,
Furca short—occurring in pools, ------------------ *navus.*
Furca elongated—limnetic in habit, --------------- *pulchellus.*
Second joint of fifth foot with one terminal and one lateral seta, -------------------------------------- *Leuckarti.*
Second joint of fifth foot with three setæ,
With clavate seta on twelfth antennal segment, inner margin of furca not beset with hairs, egg-sacs lying away from abdomen, -------------- *albidus.*
Sensory hair on twelfth antennal segment, inner margin of furca beset with hairs, egg-sacs close to abdomen, ------------------------------- *fuscus.*
Antennæ 16-jointed, fifth foot three-jointed, --------------- *modestus.*
Antennæ 12-jointed, fifth foot one-jointed,
Furca variable in length, armed externally with a row of fine spines, -------------------------------------- *serrulatus.*
Furca short, without armature of spines—a small limnetic species, --- *fluviatilis.*
Antennæ 11-jointed,
Swimming feet 3-jointed, ------------------------------ *phaleratus.*
Swimming feet 2-jointed, ------------------------------ *bicolor.*
Antennæ 8-jointed, -- *fimbriatus.*

Cyclops ater Herrick.

Plate VI, figs. 1-4, 6, and 12.

1882. *C. ater* Herrick, p. 228, pl. III, figs. 9–12.
1884. " " " p. 145, pl. Q, figs. 9–12.
1887. " " " p. 14.

The cephalothorax is oval, nearly as broad as long, with the lateral angles produced caudally. The first segment equals two-thirds the total length of the cephalothorax.

The antennæ are 17-jointed, about as long as the cephalothorax, its segments having the typical armature of the *Cyclopidæ*. The last two segments have a smooth hyaline lamella, which in the last segment projects as a flat, blunt process beyond the end of the joint.

The abdomen is of moderate length, the last segment being armed posteriorly with a row of fine spines. The furca is rather more than twice as long as its width. The lateral spine is situated near the end. Of the terminal setæ, the outer is slightly shorter than the inner, the second is about twice as long as the outer, and the third about three times as long.

The swimming feet are armed as follows:

FIRST FOOT.

Outer br.	ex. 3 spines.	Inner br.	ex. 1 seta.
	ap. 2 setæ.		ap. 1 spine, 1 seta.
	in. 3 setæ.		in. 3 setæ.

SECOND AND THIRD FEET.

Outer br.	ex. 3 spines.	Inner br.	ex. 1 seta.
	ap. 1 spine, 1 seta.		ap. 1 spine, 1 seta.
	in. 4 setæ.		in. 3 setæ.

FOURTH FEET.

Outer br.	ex. 2 spines.	Inner br.	ex. 1 seta.
	ap. 1 spine, 1 seta.		ap. 2 spines.
	in. 4 setæ.		in. 2 setæ.

The fifth foot is one-jointed, and armed with a stout spine and two long setæ.

Average length 1. 77 mm.

A large, very robust form, of striking appearance because of its deep colors. The colors of the St. Clair specimens were as follows: antennæ, antennules, swimming feet and furcal setæ dark blue, almost black. The caudal margins of the cephalothorax have the same color. On each side of the abdomen, and extending to the ends of the furcæ is a strip of the same color but darker. Borders of the cephalothorax tinged with green. Oviducts white. The ovary is orange.

To the naked eye it resembles closely in form, size, and color an *Arrenurus* with which it is found associated. This may be a case of protective mimicry.

This species was originally described by Herrick in 1882, and is mentioned by him in his succeeding reports of 1884 and 1887, but has been noted by no other author. It was discovered by Professor Reighard in the St. Clair collections, and was worked out very thoroughly by him. It is from his notes that the above description is taken.

This seems to be a somewhat rare form in this region. I have found a few individuals in Rush Lake, Wisconsin, and in Michigan, besides in the St. Clair collections, have found it in Twenty-Sixth Lake, Intermediate Lake and Susan Lake. Where it occurs it is easily detected because of its large size and prominent colors. The specimens from Round Lake had more of the red color, so much so that this, on a superficial examination, seemed to be the most prominent color.

CYCLOPS BREVISPINOSUS Herrick.

Plate VII, fig. 12.

1884. *C. brevispinosus* Herrick, p. 148, pl. S, figs. 7-11.
1893. " " Marsh, p. 205, pl. IV, figs. 11 and 12.

C. brevispinosus occurred in the collections from Lake St. Clair, the Detroit river, Lake Erie, Susan Lake, Beaver Island, Intermediate Lake and Round Lake. I have found it in collections from Lake Superior and Lake Ontario, but, curiously, never in Lake Michigan collections.

CYCLOPS PULCHELLUS Koch.

Plate VII, fig. 14.

1838. *C. pulchellus* Koch, H. 21, pl. 2.
1857. “ *bicuspidatus* Claus, p. 209, pl. XI, figs. 6 and 7.
1863. “ “ “ p. 101.
1863. “ *pulchellus* Sars, p. 246.
1870. “ *bicuspidatus* Heller, p. 71.
1872. “ “ Fric, p. 221, fig. 6.
1876. “ “ Hoek, p. 17, pl. I, figs. 7-11.
1880. “ *pulchellus* Rehberg, p. 543.
1880. “ *helgolandicus* Rehberg ('80a), p. 64, pl. IV, fig. 5.
1882. “ *Thomasi* Forbes, p. 649, pl. IX, figs. 10, 11, and 16.
1883. “ *pectinatus* Herrick, p. 499, pl. VII, figs. 25, 28.
1883. “ *Thomasi* Cragin, p. 13, pl. III, figs. 1-13.
1884. “ “ Herrick, p. 151, pl. U, figs. 4, 5, 7, and 8.
1885. “ *pulchellus* Daday, p. 220.
1886. “ “ Vosseler, p. 194, pl. V, figs. 19-28.
1890. “ “ Lande, p. 50, pl. XXI, figs. 146-155.
1891. “ *Thomasi* Forbes, p. 707, pl. II, fig. 8.
1891. “ *bicuspidatus* Brady, p. 13, pl. V, figs 1-5.
1891. “ *Thomasi* Brady, p. 14, pl. VI, figs. 1-4.
1891. “ *bicuspidatus* Schmeil, p. 27.
1891. “ “ Richard, p. 229, pl. VI, fig. 6.
1892. “ “ Schmeil, p. 75, pl. II, figs. 1-3.
1893. “ *Thomasi* Forbes, p. 249, pl. XXXIX, figs. 9-12, pl. XL, fig. 13.
1893. “ *pulchellus* Marsh, p. 207, pl. IV, figs. 18-19.

C. pulchellus is the common *Cyclops* of the Great Lakes. It occurs sometimes in smaller bodies of water, but in the collections from Michigan I have not found it from any of the small lakes except Pine Lake and Round Lake.

According to Forbes ('82 b) *C. pulchellus* and the *Diaptomi* form the greater part of the food of the young white fish.

CYCLOPS PARCUS Herrick.

1882. *C. parcus* Herrick, p. 229, pl. VI, figs. 12-15.
1884. “ “ “ p. 148, pl. R, fig. 22.
1893. “ “ Marsh, p. 208, pl. IV, fig. 16, pl. V, fig. 1.

I have found *C. parcus* only in the collections from Lake St. Clair.

CYCLOPS LEUCKARTI Sars.

Plate VII, fig. 15.

1863. *C. Leuckarti* Sars, p. 239.
1874. “ *simplex* Poggenpol, p. 70, pl. XV, figs. 1-3.
1875. “ *tenuicornis* Uljanin, p. 30, pl. IX, figs. 12 and 13.
1876. “ *Leeuwenhoekii* Hoek, p. 19, pl. III, figs. 1-12.
1880. “ *simplex* Rehberg, p. 542.
1884. “ “ Herrick, p. 150.

1884. *C. oithonoides* Herrick, p. 150, pl. S, figs. 2–6.
1885. “ *Leuckarti* Daday, p. 218.
1885. “ *simplex* Daday, p. 236.
1885. “ *pectinatus* Daday, p. 223, pl. I, figs. 7–13.
1886. “ *simplex* Vosseler, p. 193, pl. IV, figs. 15–17.
1887. “ “ Herrick, p. 17, pl. VII, fig. 1, a-j.
1890. “ “ Thallwitz, p. 79.
1890. “ “ Lande, p. 55, pl. XVI, figs. 42–45; pl. XVII, figs. 46–50.
1891. “ *Leuckarti* Schmeil, p. 25.
1891. “ *edax* Forbes, p. 709, pl. III, fig. 15; pl. IV, figs. 16–19.
1891. “ *Scourfeldi* Brady (?) p. 10, pl. IV, figs. 1–8.
1891. “ *Leuckarti* Richard, p. 230, pl. VI, fig. 20.
1892. “ “ Schmeil, p. 57, pl. III. figs. 1–8.
1893. “ “ Marsh, p. 209, pl. IV, fig. 17; pl. V, figs. 2–6.

I have no doubt that, as stated by Schmeil, *C. Leuckarti* Claus and *C. Leuckarti* Sars are identical, and that possibly by strict laws of priority Claus should be given as authority for the name. Yet, as the description by Claus is not only imperfect, but in many respects inaccurate and misleading, I have preferred to retain the designation of *C. Leuckarti* Sars. Other points in the synonomy are discussed in Schmeil '92 and Marsh '93.

As would be expected, this species was distributed almost universally in the waters examined.

CYCLOPS FUSCUS Jurine.

Plate VI, figs. 5, 7 and 11.

1820. *Monoculus quadricornis fuscus* Jurine, p. 47, pl. II, fig. 2.
1841. *C. signatus* Koch, H 21, pl. VIII.
1850. “ *quadricornis var. c* Baird, p. 203, pl. XXIV, fig. 5.
1857. “ *coronatus* Claus, p. 29, pl. I, fig. 5, and pl. II, figs. 1–11.
1863. “ “ “ p. 97, pl. II, fig. 16; pl. X, fig. 1.
1863. “ *signatus* Sars, p. 242.
1863. “ *coronatus* Lubbock, p. 199.
1870. “ “ Heller, p. 71.
1872. “ “ Fric, p. 218, fig. 12.
1876. “ “ Hoek, p. 12.
1878. “ *signatus* Brady, p. 100, pl. XVII, figs. 4–12.
1882. “ *tenuicornis* Herrick, p. 227, pl. V, fig. 14; pl. VI, figs. 1–11, and 20.
1884. “ *tenuicornis* Herrick, p. 153, pl. R, fig. 16; pl. Q', figs. 8-11, and 20.
1885. “ *signatus* Daday, p. 208.
1886. “ “ Vosseler, p. 189, pl. IV, figs. 6–10.
1888. “ *fuscus* Sostariç, p. 58.
1890. “ *signatus* Thallwitz, p. 79.
1890. “ “ Lande, p. 33, pl. XV, figs. 1–12.
1891. “ “ Brady, p. 6, pl. 2, fig. 5.
1891. “ *fuscus* Richard, p. 223, pl. VI, fig. 6.
1891. “ “ Schmeil, p. 22.
1892. “ “ “ p. 123, pl. I, figs. 1–7b; pl. IV, fig. 2.
1893. “ *signatus* Marsh, p. 211.

In my paper on the Wisconsin *Cyclopidæ* and *Calanidæ* ('93), agreeing with Herrick and Brady, I expressed my belief that the two forms here called *fuscus* and *albidus*, the *coronatus* and *tenuicornis* of Claus, belonged to the same species, *fuscus* being the more mature form. Since writing that paper I have examined a large number of specimens from widely separated localities, and I must acknowledge that I was wrong, and that, as stated by Schmeil ('92), the two forms must be considered distinct, for I have been utterly unable to find the connecting forms. The points of difference, as stated so elaborately by Schmeil, hold good for the American specimens. *C. fuscus* has a sensory hair on the twelfth antennal segment, the hyaline lamella of the 17th segment deeply notched, the third segment of the antennule short, the inner borders of the furca thickly beset with hairs, and the egg sacs lie close to the abdomen, while *C. albidus* has a clavate seta on the twelfth antennal segment, the membrane of the 17th segment serrate or smooth, the inner borders of the furca either without hairs or with only fine hairs, and the egg sacs lie separated from the abdomen. These characters, with the greater size of *C. fuscus*, serve to distinguish the species, while the less evident characters mentioned by Schmeil are easily demonstrated.

One characteristic not mentioned by Schmeil I have found constantly in my specimens. The larger of the two terminal spines of the endopodite of the fourth foot, instead of being serrated on its edges as is customary in all the spines of the swimming feet, is beset on its inner margin with long, rather irregular teeth, as shown in the plate. (Plate VI, fig. 7.) If this peculiarity exists in the European forms, it would seem probable that it would have been noted by some observer, but I have nowhere seen an account of it. It may serve then to indicate a slight variation from the European type.

I have found *C. fuscus* in the Michigan collections from only one locality, Intermediate Lake. I have found it in several Wisconsin localities, though nowhere abundantly, and it is probable that it occurs in other localities in Michigan.

CYCLOPS ALBIDUS Jurine.

Plate VI, figs. 8–10.

1820. *Monoculus quadricornis albidus* Jurine, pp. 44 and 47, pl. II, figs. 10 and 11; pl. III, fig. 24.
1841. *C. annulicornis* Koch, H 21, pl. VI.
1850. " *quadricornis* var. *b* Baird, p. 202, pl. XXIV, fig. 4.
1857. " *tenuicornis* Claus, p. 31, pl. III, figs. 1–11.
1857. " *pennatus* Claus, p. 35, pl. III, figs. 12–17.
1863. " *tenuicornis* Claus, p. 99, pl. I, fig. 3; pl. II, fig. 17; pl. IV, fig. 5.
1863. " *tenuicornis* Sars, p. 242.
1863. " *annulicornis* Sars, p. 243.
1863. " *tenuicornis* Lubbock, p. 202.
1870. " *tenuicornis* Heller, p. 71.
1872. " " Fric, p. 219, fig. 12.
1874. " *Clausii* Poggenpol, p. 70, pl. XV, figs. 4–14.
1875. " *signatus* Uljanin, p. 29, pl. IX, figs. 6–11; pl XI, fig. 8.
1876. " " Hoek, p. 12, pl. I, figs. 1–4.

1878. *C. tenuicornis* Brady, p. 102, pl. XVII, figs. 1–10.
1882. " " Herrick.
1883. " " Cragin, p. 3, pl. II, figs. 1–14.
1883. " *signatus* var. *fasciacornis* Cragin, p. 2, pl. II, fig. 15.
1884. " *tenuicornis* var. *a* Herrick, p. 153, pl. Q^4, figs. 1–7.
1885. " " Daday, p. 211.
1886. " " Vosseler, p. 189, pl. IV, figs. 6–10.
1888. " *albidus* Sostariç, pl. I, figs. 3, 4 and 12.
1890. " *tenuicornis* Thallwitz, p. 79.
1890. " " Lande, p. 36, pl. XVI, figs. 22–32.
1891. " *gyrinus* Forbes, p. 707, pl. II, fig. 9; pl. III, fig. 14.
1891. " *albidus* Schmeil, p. 23.
1891. " *annulicornis* and *tenuicornis* Richard, pp. 224–226.
1892. " *albidus* Schmeil, p. 128, pl. I, figs. 8–14b; pl. IV, fig. 2.
1893. " *signatus* Marsh, p. 211, pl. V, figs. 7–9.

Schmeil states that the antennæ of *C. albidus* are armed with crowns of spines as in the case of *C. fuscus*. This seems to be rarely true in our forms. Although I have examined with great care large numbers of mature females, it is only in very few specimens that I have found this peculiar armature. The membrane of the terminal antennal segment is ordinarily serrate. The common form corresponds to the *annulicornis* of Sars and Richard, which, according to Schmeil, Richard now allows to be a variety of *albidus*. The distinguishing characteristic of *annulicornis* is the rudimentary seta of the inner margin of the terminal segment of the endopodite of the fourth foot. This is represented in most of my specimens only by a minute spine. (Pl. VI, fig. 9.) In two individuals I have found in place of this minute spine a short seta. (Pl. VI, fig. 8.) In these two specimens the circlets of spines were present on the 8th, 9th, 10th, 12th, 13th, and 14th segments. It was this form evidently that Cragin called *C. tenuicornis* ('83 pl. II, figs. 1–14), as is shown very clearly by the figures of the fourth foot and antennule, although he did not figure the circlets of spines on the antennal segments. *C. signatus* var. *fasciacornis* Cragin, it is not possible to identify with certainty, although it seems probable that it is *albidus*. *C. gyrinus* Forbes does not have the antennal circlets of spines, but does have a short seta instead of a minute spine on the fourth foot, thus agreeing with Cragin's figures of *C. tenuicornis*. This would seem to be intermediate between the two forms I have seen. It is difficult in such a case to tell just where the limits of species should be drawn, for we are entirely ignorant of the life histories of the forms, and it is certain that the *Cyclopidæ* have wide limits of variation. It seems to me safer, for the present, at least, to consider such minute differences as varietal, and not to increase the number of species.

C. albidus is not very abundant, but occurred in many of the St. Clair collections, and in some of those from other points in Michigan. It is a universally distributed species, but does not occur in great numbers.

CYCLOPS FLUVIATILIS Herrick.

1882. *C. fluviatilis* Herrick, p. 231, pl. VII, figs. 1–9.
1883. " *magnoclavus* Cragin, p. 5, pl. II, figs 14–23.
1884. " *fluviatilis* Herrick, p. 159, pl. Q^5, figs. 1–9.
1887. " " Herrick, p. 15.

1891. *C. magnoctavus* Brady, p. 19, figs. 1–4.
1893. " *fluviatilis* Marsh, p. 214, pl. V, figs. 14 and 15; pl. VI, fig. 1.

C. fluviatilis occurs in most of the limnetic collections in all except the smallest bodies of water.

CYCLOPS SERRULATUS Fischer.

1851. *C. serrulatus* Fischer, p. 423, pl. X, figs. 22, 23, 26–31.
1853. " " Lilljeborg, p. 158, pl. XV, fig. 12.
1857. " " Claus, p. 36, figs. 1–3.
1863. " " Sars, p. 254.
1863. " " Claus, p. 101, pl. I, figs. 1 and 2; pl. IV, fig. 12; pl. XI, fig. 3.
1863. " " Lubbock, p. 197.
1870. " " Heller, p. 72.
1872. " " Fric, p. 222, fig. 18.
1875. " " Uljanin, p. 34, pl. VIII, figs. 1–8.
1878. " " Brady, p. 109, pl. XXII, figs. 1–6.
1878. " " var. *montanus* Brady, p. 110, pl. XXII, figs. 7–14.
1880. " *agilis* Rehberg, p. 545.
1882. " " Forbes, p. 649.
1882. " *serrulatus* Herrick, p. 230, pl. V, figs. 1–5; pl. VII, fig. 10.
1883. " *pectinifer* Cragin, p. 6, pl. IV, figs. 1–7.
1884. " *serrulatus* Herrick, p. 157, pl. O, figs. 17–19.
1884. " " var. *elegans* Herrick, p. 158.
1885. " *agilis* Daday, p. 240.
1886. " " Vosseler, p. 190, pl. V, figs. 29–31.
1890. " " Thallwitz, p. 79.
1890. " " Lande, p. 60, pl. XVII, fig. 69; pl. XVIII, figs. 70–80.
1891. " *serrulatus* Schmeil, p. 29.
1891. " " Richard, p. 234, pl. VI, figs. 6–12.
1891. " *agilis* Forbes, p. 710.
1892. " *serrulatus* Schmeil, p. 141, pl. V, figs. 6–12.
1893. " " Marsh, p. 215, pl. VI, figs. 2–5.

This well known species occurs everywhere in Michigan waters and with the same variations in structure which I have noted in the collections made in Wisconsin. (Marsh '93, pp. 215–216.)

CYCLOPS PHALERATUS Koch.

1838. *C. phaleratus* Koch, H 21, pl. IX.
1851. " *canthocarpoides* Fischer, p. 426, pl. X, figs. 24, 25, 32–38.
1853. " " Lilljeborg, p. 208.
1857. " " Claus, p. 37, pl. I, figs. 6–10.
1863. " " " p. 102, pl. IV, figs. 1–4.
1863. " " Lubbock, p. 202.
1863. " *phaleratus* Sars, p. 255.
1872. " *canthocarpoides* Fric, p. 223, fig. 19.
1874. " *lascivus* Poggenpol, p. 72, pl. XV. figs. 22–24; pl. XVI, figs. 7 and 8.
1875. " *phaleratus* Uljanin, p. 38, pl. IX, figs. 1–5.
1878. " " Brady, p. 116, pl. XXIII, figs. 7–13.
1882. " *adolescens* Herrick, p. 231, pl. VI, figs. 15–20.

1883. *C. perarmatus* Cragin, p. 7, pl. I, figs. 9–18.
1884. " *phaleratus* Herrick, p. 161, pl. R, figs. 6–10.
1885. " " Daday, p. 252.
1887. " " Herrick, p. 14, pl. VII, figs. 2, a–d.
1888. " " Sostariç, p. 74, pl. II, figs. 21–22.
1890. " " Lande, p. 75. pl. XX, figs. 126–136.
1891. " " Schmeil, p. 36.
1891. " " Brady, p. 25, pl. IX, fig. 2.
1891. " " Richard, p. 238, pl. VI, fig. 12.
1892. " " Schmeil, p. 170, pl. VIII, figs. 1–11.
1893. " " Marsh, p. 216, pl. VI. figs. 6 and 7.

I have found *C. phaleratus* in the collections from only three localities,—Lake St. Clair, Intermediate Lake, and Twenty-sixth Lake. Very little attention, however, was paid in the collections to the smaller lakes and stagnant pools, and it is probable that in such localities it occurs generally distributed through the State.

CYCLOPS BICOLOR Sars.

Plate I, figs. 5–7.

1863. *C. bicolor* Sars, p. 253.
1880. " *diaphanus* Rehberg, p. 547.
1884. " " Herrick, p. 160, pl. R, fig. 12.
1885. " " Daday, p. 246.
1885. " *brevisetosus* Daday, p. 255, pl. III, figs. 3, 5 and 10.
1887. " *diaphanus* Herrick, p. 16, pl. VII, figs. 3 a–e.
1888. " " Lande. p. 67, pl. 18, figs. 91–98.
1891. " *bicolor* Schmeil, p. 34.
1891. " *diaphanus* Richard, p. 236, pl. VI, fig. 26.
1892. " *bicolor* Schmeil, p. 118, pl. VI, figs. 6–13.
1893. " " Marsh, p. 217.

I have found *C. bicolor* in the collections from three of the Michigan lakes—Lake St. Clair, Intermediate Lake, and South Lake on Beaver Island. Doubtless more thorough collections from small lakes and stagnant pools would furnish other localities, though this species seems to be nowhere very abundant. I have found, in a collection from a lake in northern Wisconsin, an egg-bearing female with ten-jointed antennæ, the fourth and fifth joints of the eleven-jointed variety being united in one. Unless this specimen should be considered a monstrosity, we would infer that this species can reproduce in either the ten or eleven-jointed stage.

I have added to the synonomy as previously given *C. brevisetosus* Daday. I do not feel certain of the identity of the two forms, and yet it seems to me probable that they are the same. I can not read the Hungarian, but from the Latin synopsis and the figures I can not help thinking that *brevisetosus* is the same as *bicolor*. The points of difference are the following. The furca of *brevisetosus* is longer than in typical *bicolor*. The armature of the swimming feet does not correspond to Daday's description, but the one figure which he gives of a swimming foot closely resembles the structure of *bicolor*, and does not correspond to his own description. The antennæ of *brevisetosus* are ten-jointed, but they correspond exactly to the structure of my ten-jointed specimen of *bicolor*. In all other respects the descriptions agree.

BIBLIOGRAPHY.

Although the list of papers consulted is very nearly the same as that of my paper on the Wisconsin *Cyclopidæ* and *Calanidæ*, I have though it best to insert it in this paper for convenience of reference. I have not had the opportunity of seeing the original paper of Poggenpol, nor the papers of Sostariç and Thallwitz, and the quotations from those authors are taken from Schmeil. In all other cases I have personally verified the references.

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EXPLANATION OF PLATES.

PLATE I.

Fig. 1. *Diaptomus Reighardi*—fifth feet of female x 340.
2. " " abdomen of male x 195.
3. " " fifth feet of male x 223.
4. " " abdomen of female x 190.
5. *Cyclops bicolor*—abdomen of female x 269.
6. " " antenna of female x 333.
7. " " 10-jointed antenna of female x 325.

PLATE II.

Fig. 1. *Epischura lacustris*—antenna of female x 113.
2. " " right antenna of male x 113.
3. " " antennule x 113a.
4. " " mandible and palpus x 217.
5. " " second maxillipede x 217.
6. " " first maxillipede x 217.

PLATE III.

Fig. 1. *Epischura lacustris*—first foot x 217.
2. " " second foot x 153.
3. " " fifth foot of female x 217.
4. " " fifth foot of male x 153.
5. " " abdomen of female x 113.
6. " " abdomen of male x 113.

PLATE IV.

Fig. 1. *L. macrurus*—right antenna of male x 275.
2. " " left antenna of male x 275.

PLATE V.

Fig. 1. *L. macrurus*—first foot x 275.
2. " " second foot x 275.
3. " " fifth foot of female x 275.
4. " " fifth foot of male x 275.
5. " " second and third joints of second maxillipede x 275.

PLATE VI.

Fig. 1. *Cyclops ater*—abdomen of male x 146.
2. " " receptaculum seminis x 113.
3. " " fourth foot x 113.
4. " " 11th, 12th, and 13th antennal segments of female x 113.
5. " *fuscus*—terminal joints of female antenna x 217.
6. " *ater*—terminal joints of female antenna x 217.
7. " *fuscus*—terminal joint of endopodite of fourth foot x 217.
8. " *albidus*—terminal joint of endopodite of fourth foot x 280.
9. " " terminal joint of endopodite of fourth foot x 280.
10. " " antennule x 217.
11. " *fuscus*—antennule, first three joints x 217.
12. " *ater*—outline of cephalothorax of female x 108.

PLATE VII.

Fig. 1. *Diaptomus sicilis*—fifth feet of male x 140.
2. " *Ashlandi*—fifth feet of male x 140.
3. " *minutus*—fifth feet of male x 140.
4. " " fifth foot of female x 250.
5. " *oregonensis*—fifth feet of male x 140.
6. " *pallidus*—fifth feet of male x 200.
7. " *leptopus*—fifth feet of male x 138.
8. " *sanguineus*—fifth feet of male x 138.
9. " *Birgei*—fifth feet of male x 136.
10. " *sanguineus*—terminal joints of male antenna x 136.
11. " *sicilis*—terminal joints of male antenna x 136.
12. *Cyclops brevispinosus*—fifth foot x 250.
13. " *modestus*—fifth foot x 250.
14. " *pulchellus*—fifth foot x 250.
15. " *Leuckarti*—fifth foot x 250.

PLATE VIII.

Sketch map of Lake St. Clair and vicinity, showing collecting stations.

PLATE IX.

Sketch map of Charlevoix and vicinity showing collecting stations.

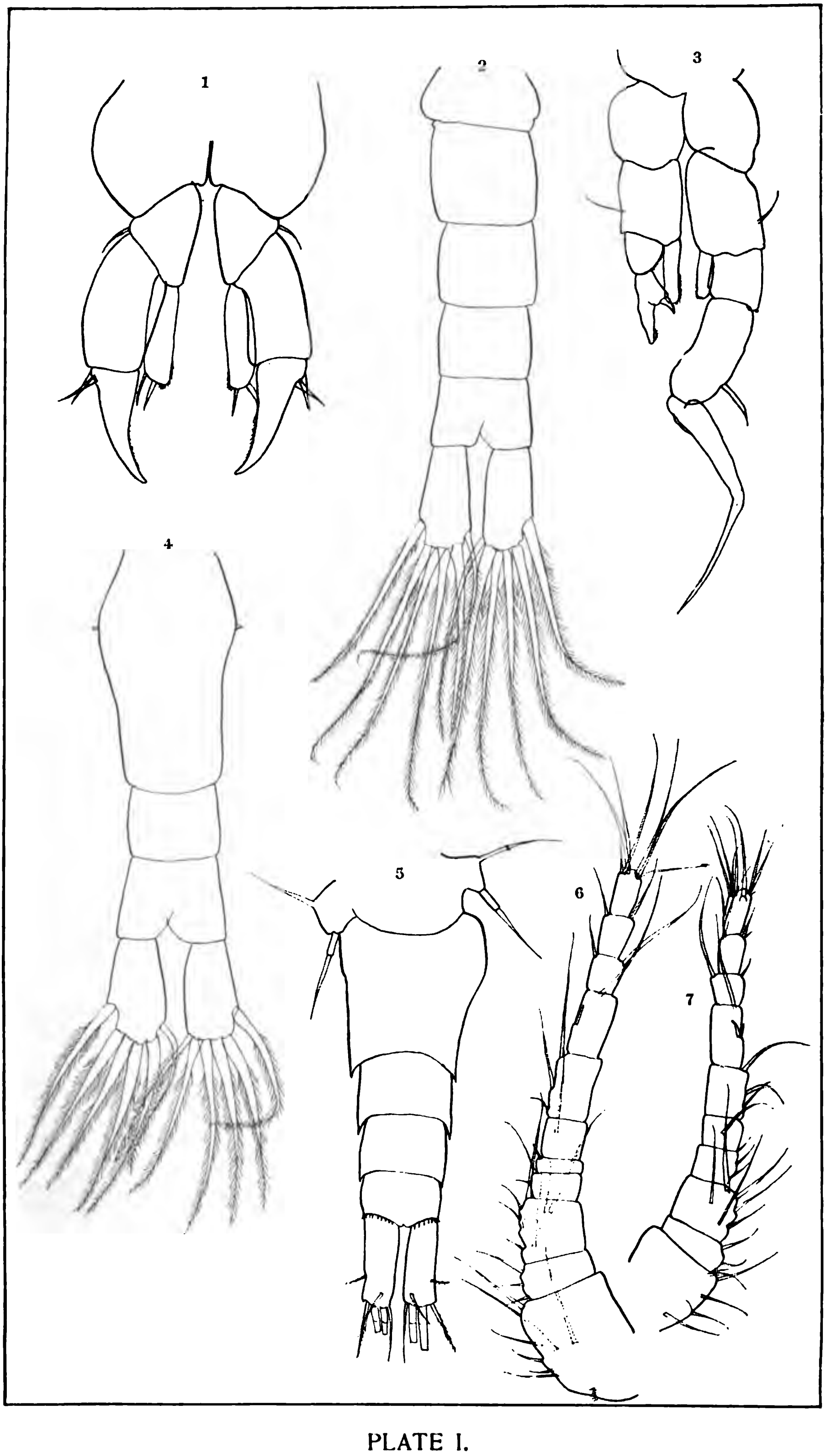


PLATE I.

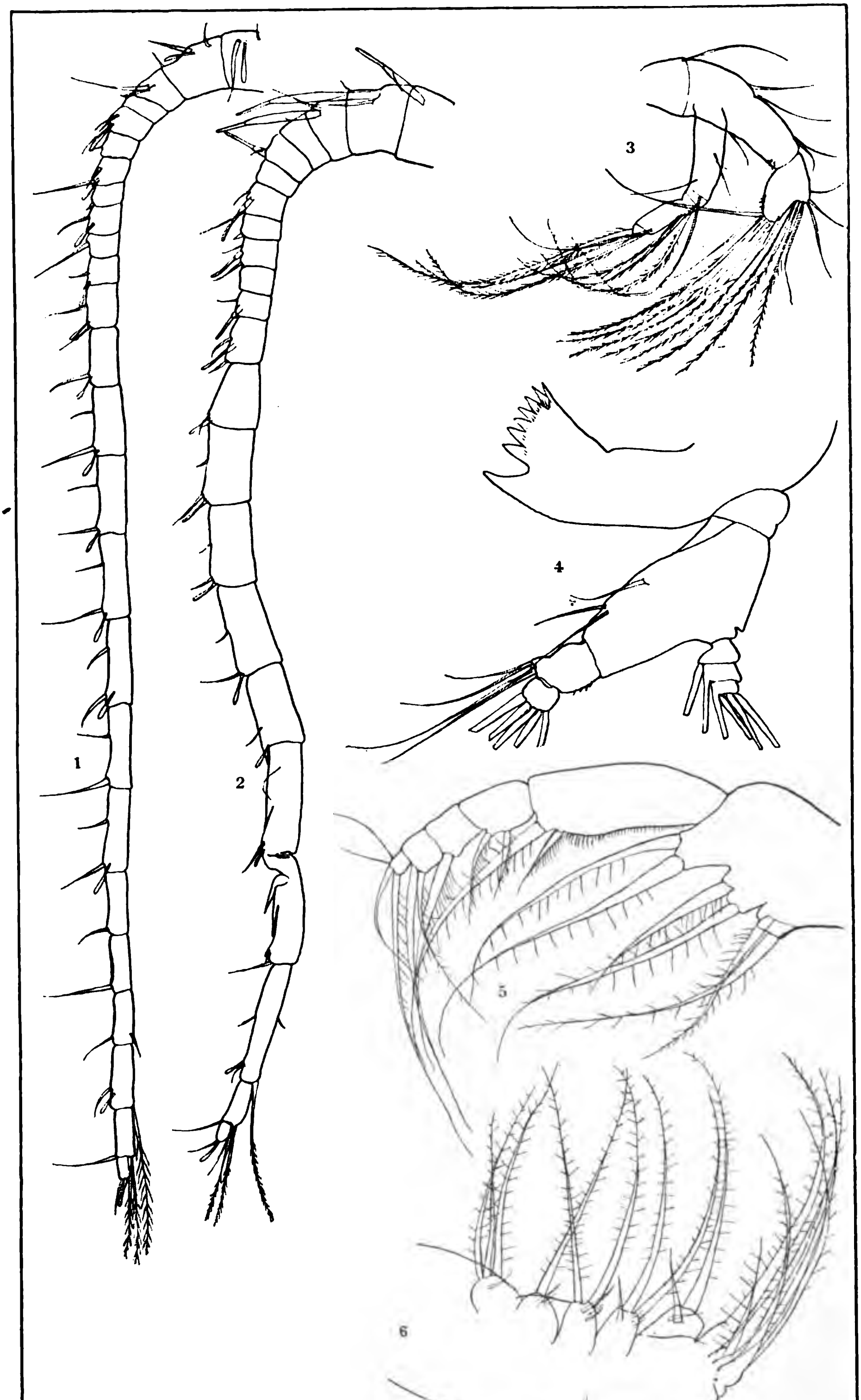


PLATE II.

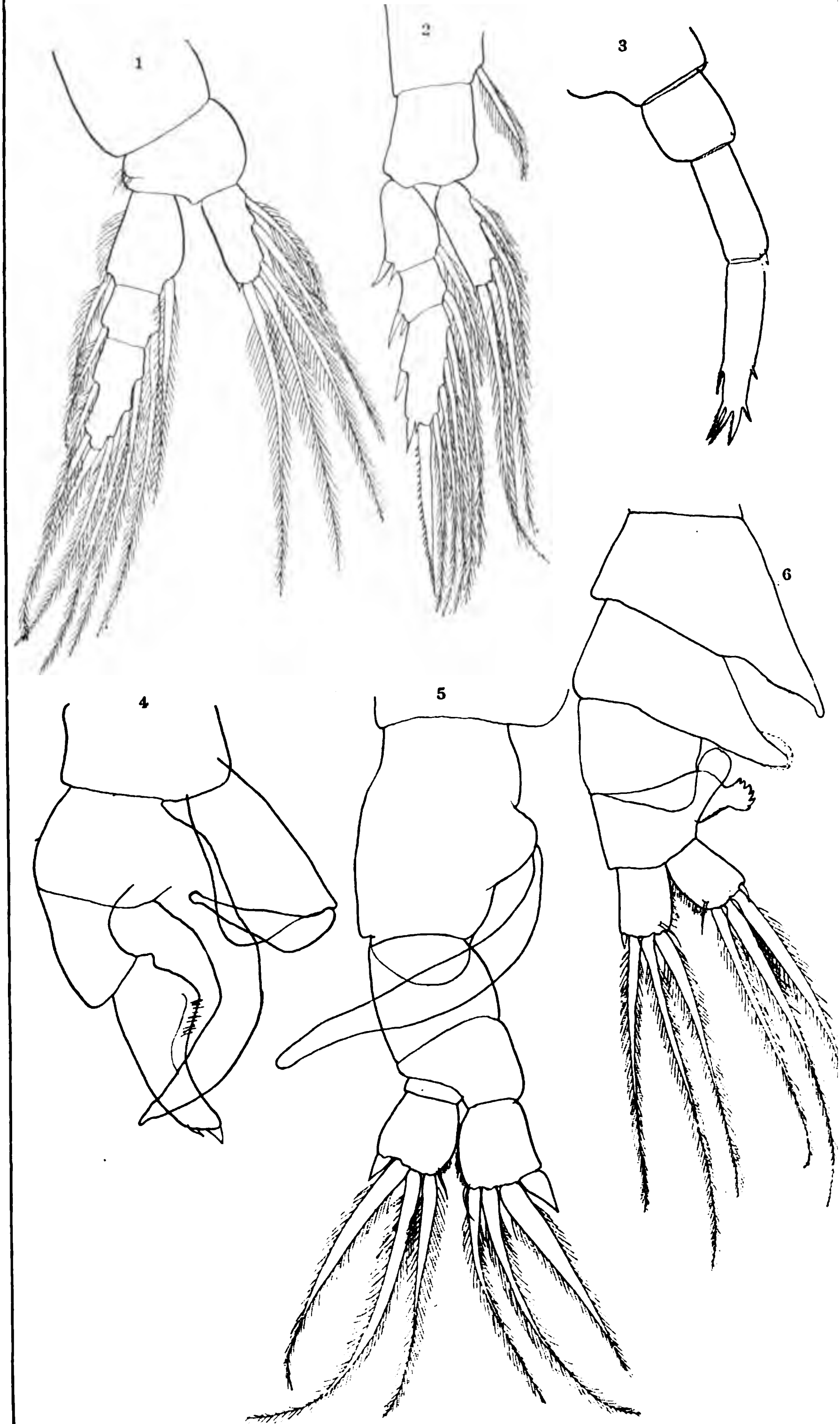
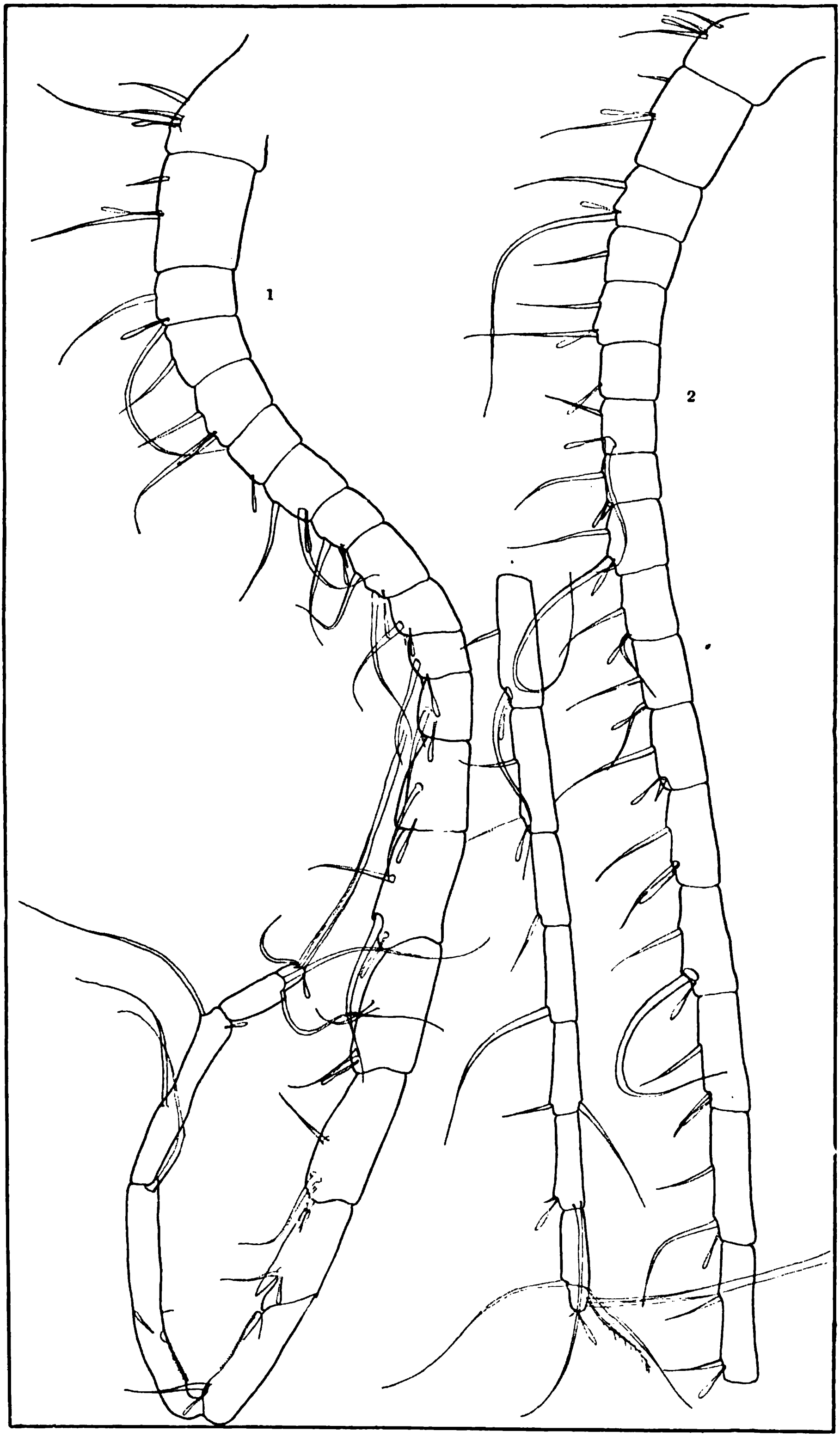


PLATE III.



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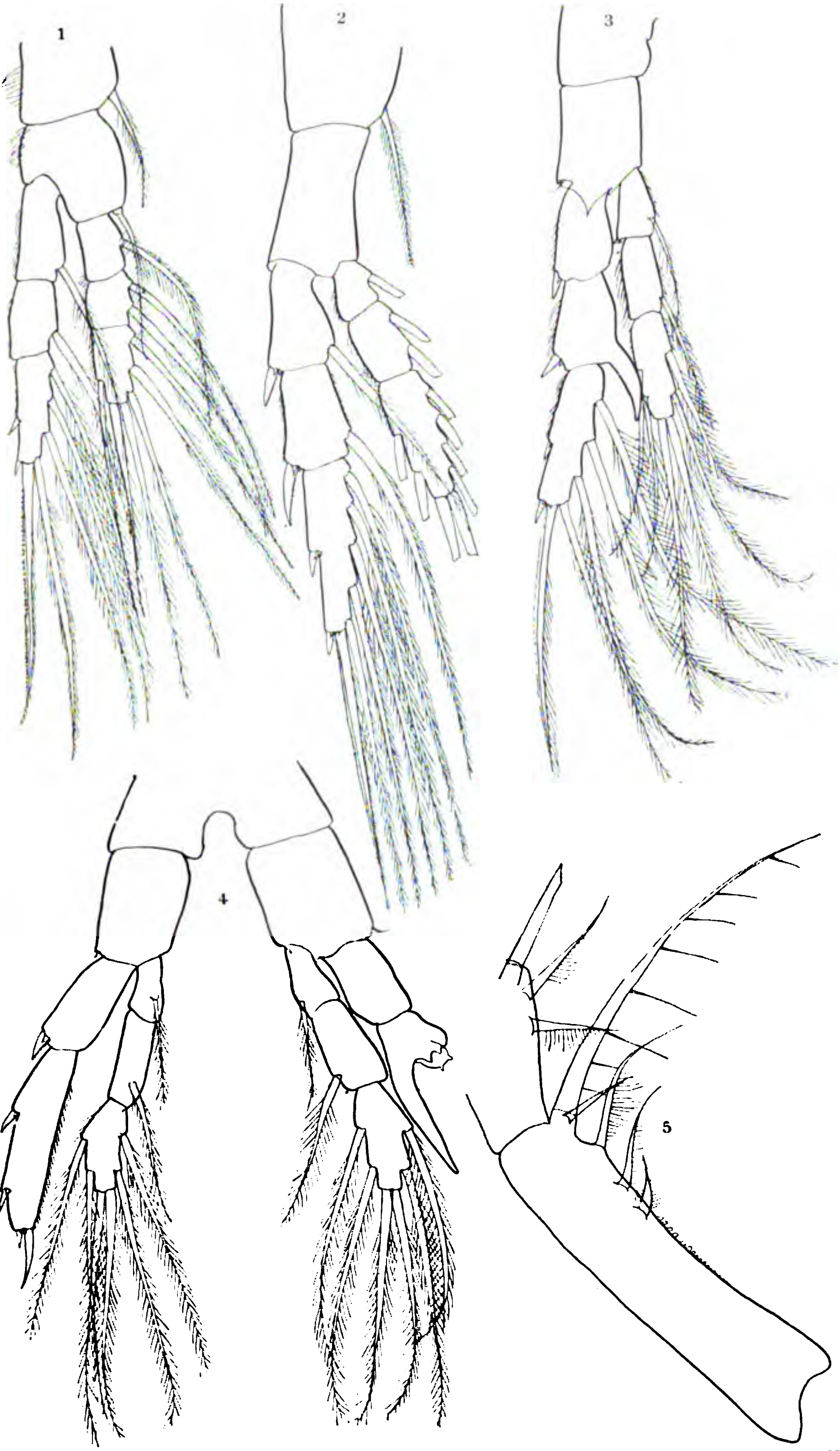


PLATE V.

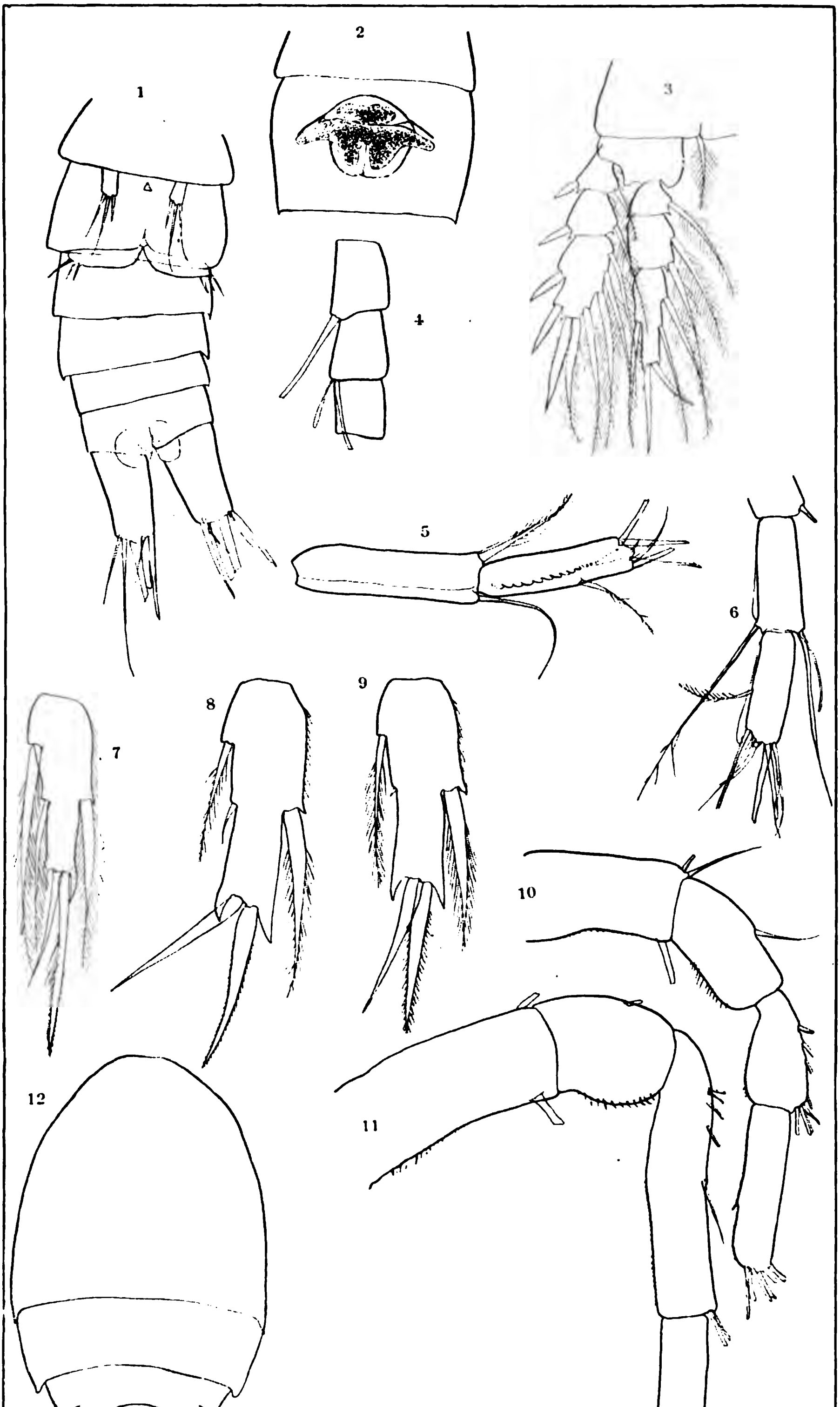


PLATE VI.

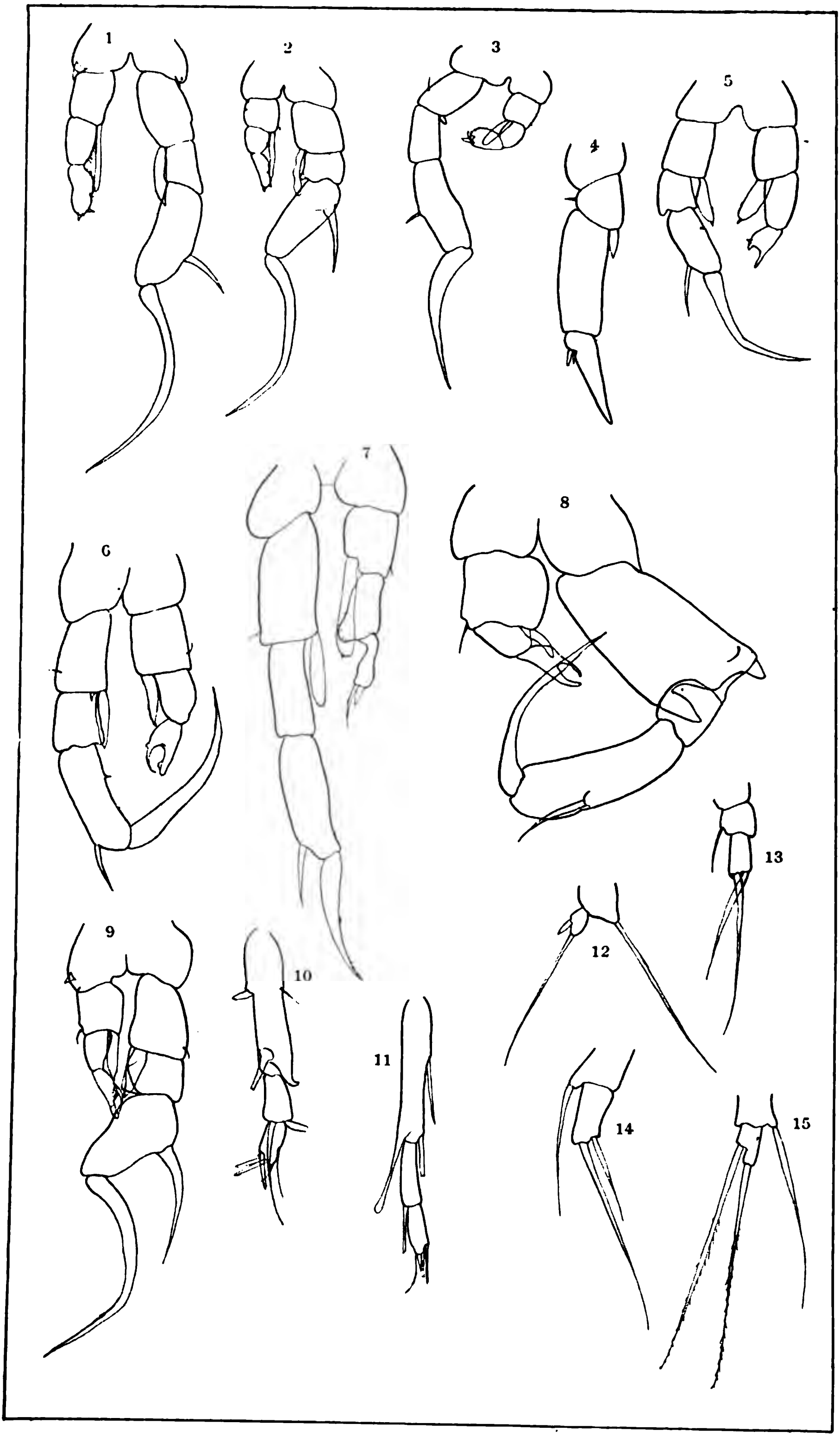


PLATE VII.

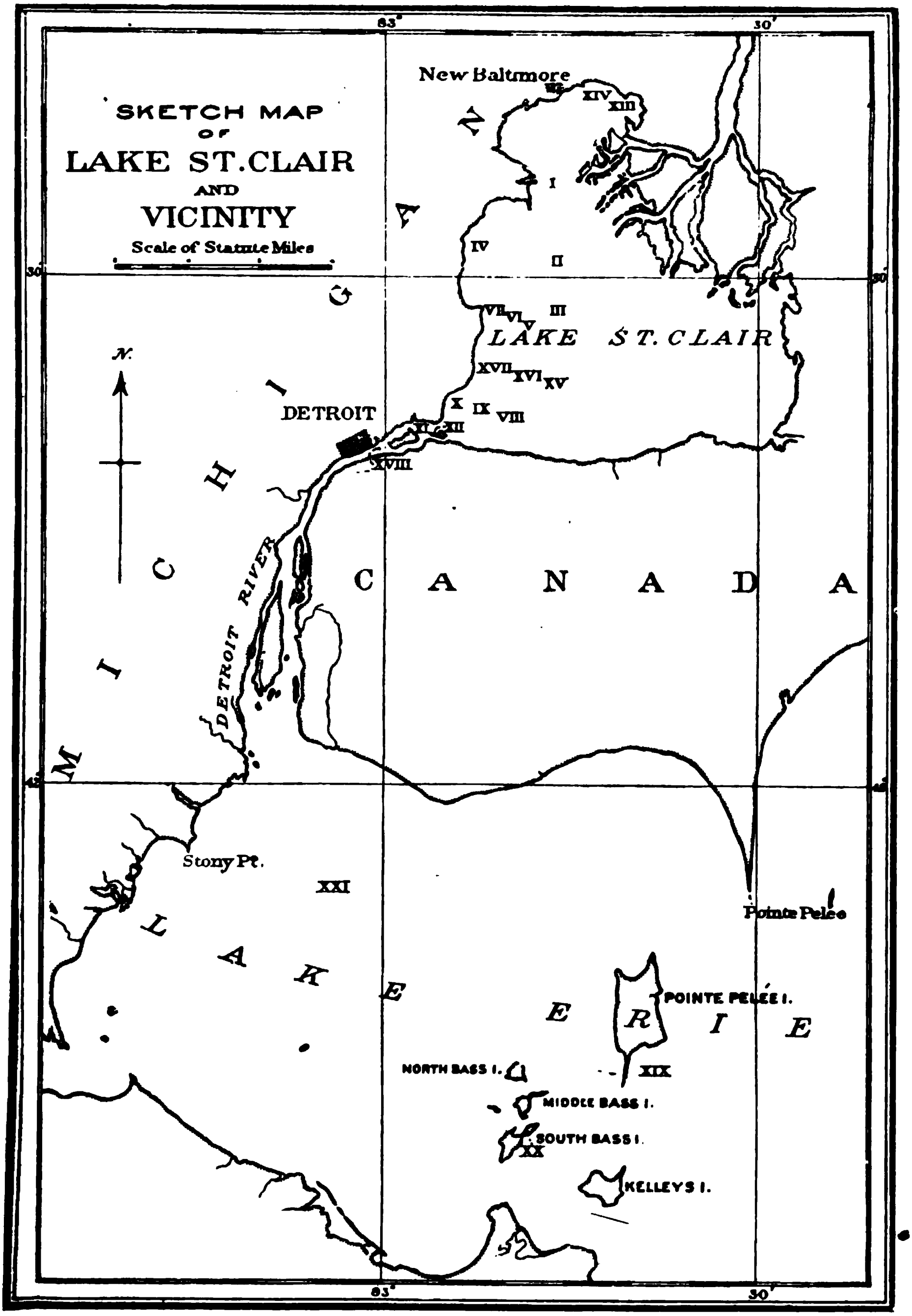
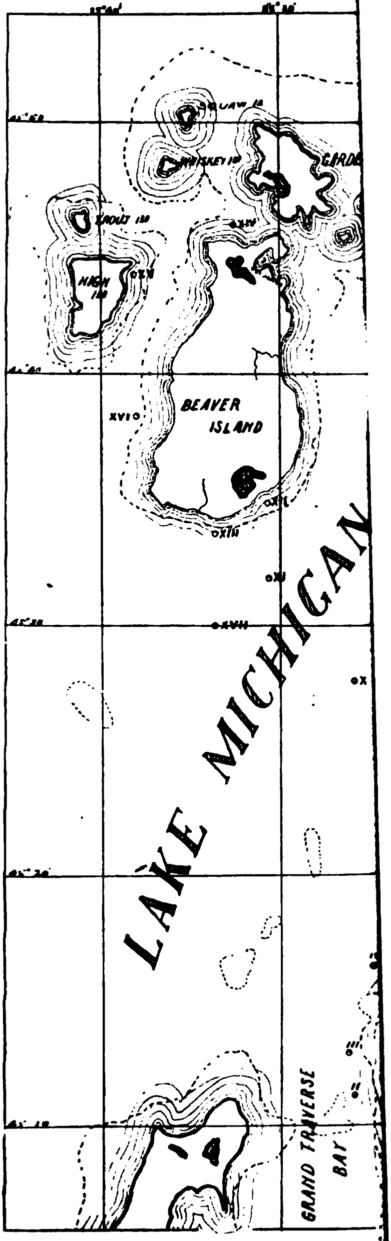

SKETCH MAP
OF
LAKE ST. CLAIR
AND
VICINITY
Scale of Statute Miles
N.
83°
30'
30'
42°
MICHIGAN
New Baltimore
XIV
XIII
I
IV
II
III
VII
VI
V
LAKE ST. CLAIR
XVII
XVI
XV
X
IX
VIII
DETROIT
XI
XII
XVIII
DETROIT RIVER
CANADA
Stony Pt.
XXI
Pointe Pelée
LAKE ERIE
POINTE PELÉE I.
NORTH BASS I.
XIX
MIDDLE BASS I.
SOUTH BASS I.
XX
KELLEYS I.

PLATE VIII.


85°40'
85°30'
45°50'
SQUAW ID
WHISKEY ID
GARDE
TROUT ID
XIV
HIGH ID
XV
45°40'
BEAVER ISLAND
XVI
XI
XIII
XII
45°30'
XVII
X
LAKE MICHIGAN
45°20'
45°10'
GRAND TRAVERSE BAY

Bulletin of the Michigan Fish Commission

No. 6

A BIOLOGICAL EXAMINATION OF LAKE MICHIGAN

IN THE

TRAVERSE BAY REGION

BY HENRY B. WARD

WITH THE FOLLOWING APPENDICES

I.	THE AQUATIC PLANTS	BY H. D. THOMPSON
II.	THE PROTOZOA	BY C. A. KOFOID
III.	THE ROTIFERA	BY H. S. JENNINGS
IV.	THE TURBELLARIA	BY W. MCM. WOODWORTH
V.	THE MOLLUSCA	BY BRYANT WALKER

LANSING
ROBERT SMITH & CO., STATE PRINTERS AND BINDERS
1896

INTRODUCTION.

During the summer of 1893 the Michigan Fish Commission entered upon a biological study of the Great Lakes by maintaining a party on Lake St. Clair. In the report of that two months, written by the director of the laboratory, Professor J. E. Reighard, are given in full the reasons which led to the inception of the undertaking and the aims which its promoters held in view. A study of the life of the lake in all its manifold interrelations and especially of those factors which bore upon the welfare of the food fishes in general and the young whitefish in particular were the ends sought. On the attainment of these ends depends the determining of those conditions most favorable for the fry, and hence the character of the places in which they should be planted. Those who may doubt the propriety of such undertakings as this will find in the report just cited (Reighard, 95*, p. 1–5) an extended and convincing discussion of the question in its various bearings.

Ever since its establishment by legislative enactment, which named specifically "the cultivation of the whitefish" among its duties, the Michigan Fish Commission has been active in effort in behalf of this important and diminishing food supply. The work of the first year of lake investigation on Lake St. Clair had been carried on in the waters of a great spawning ground of the whitefish, and it seemed wise in the second year to transfer operations to a locality which was the home of this species throughout the entire year, and which afforded hence an opportunity of studying it continuously in its natural environment. The absence of Professor Reighard in Europe prevented his taking charge of the work, and the writer, who had been his assistant during the previous summer, was asked to assume control. The opportunity was all the more readily accepted since it was joined with the express desire on the side of the Commission that the general aims of the past be kept in view and that the whitefish be made the object of especial study for the purpose of ascertaining definitely the character of its food and the life of the young which had been hitherto an absolutely unknown quantity.

The exact location of the laboratory was a matter of great importance, and in company with the superintendent of the Commission, Mr. S. Bower, I visited the Traverse Bay region. Charlevoix seemed the most available location and was selected finally by the Board of Commissioners as a center for the summer's work. A shop on the shore of Round Lake was rented and fitted up as a laboratory. An adjacent building, in which was located a small hatchery of the Commission, furnished abundant conveniences in the way of aquaria, and running water for the permanent accommodation of fish and larger forms. In this building, which was located on a fine dock, were kept the nets, dredges, trawl and other large apparatus. The laboratory proper was well equipped with tables for microscopic work and shelves for books, glassware and other necessities. A couple of tables in the center of the room held small glass aquaria and a zinc topped table near the south side afforded an opportunity for such work as required running water. Immediately north of the laboratory was a small dock from which pure water could be dipped out of Round Lake, and where in fact on more than one occasion various young fry were landed with a simple dip net. (See Pl. IV.)

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* References to the papers cited at the close of the report are indicated in this way.

The laboratory was well equipped with glassware, reagents, etc., by the Fish Commission, and the various forms of collecting apparatus were also provided by them. Most of this was the same as that used the previous year and was sufficiently described in Professor Reighard's report. In addition there was used a small trawl of six feet beam and a new form of towing net for surface work, known as the "torpedo." The trawl was of the ordinary type and the torpedo net is described elsewhere in this report. A rake dredge of the type ordinarily employed in marine work was made for our use and proved highly satisfactory in many localities. To the University of Michigan the party was indebted for the loan of numerous microscopes and accessories, various laboratory apparatus and finally an extensive library of special literature. Especial thanks are due the University authorities for their cordial cooperation in the underaking.

Small boats served the purposes of the party for the preliminary work and for occasional short excursions. Later a sailing boat of some size was tried for work on Lake Michigan, but proved too uncertain for continued use, and for the extended trips on the lakes in connection with the plankton work of the last three weeks a small fishing tug was chartered. This was the "Minnie Warren," of 13 tons capacity. Her captain, John O'Neil, has been a successful fisherman for many years and is well acquainted with all the shoals and reefs of the region on which fishing is or has been profitably pursued. We were thus enabled to ascertain the exact location of exhausted fishing grounds and to make collections on them for comparison with material obtained from other points. In general, only single day trips were made, but on one occasion a longer trip of three days to Beaver Island was planned. The first day was spent in making collections at various points en route. It had been planned to investigate the fishing grounds near the island on the second day and return the third by a different route, but a severe storm on the second day upset our calculations and forced us to spend the larger part of the second day in harbor and on the island, and to condense the work of the second and third days into the last. The route of the party may be followed on the map by the numbers of the plankton stations; ix to xiii were made the first day; the night was spent in the harbor at the northern end of the island; xiv was made the second day before the storm broke, after which we returned to the harbor for a compulsory stay of 24 hours, and xv to xvii were stations on the return route of the third day. On the first day some of the party were landed at the lower end of the island and visited the small inland lake there, and on the morning of the third day, while it was yet too rough for work outside, a trip was made to the lake in the northern part of the island. Collections were taken from these lakes for comparison with material obtained in the big lake and in the waters of the main land. This trip afforded much valuable evidence on the present condition of the whitefish grounds, some of the best of which in this entire region were visited and studied. On one other occasion, the day set for work in Grand Traverse Bay, we were overtaken by a storm and compelled to return without accomplishing the object of the trip. Otherwise the work suffered no interruption from bad weather.

The laboratory was opened June 28, when three only of the force were present. Two arrived but a few days later, and these five continued at work until September 1. Their names, and the special part of the work to which the attention of each was devoted, are appended:

Professor Henry B. Ward, University of Nebraska, Lincoln, director; quantitative work, and worms.

Professor C. Dwight Marsh, Ripon College, Ripon, Wis.; vertical distribution and Copepoda.

Dr. Charles A. Kofoid, instructor in zoology, University of Michigan, Ann Arbor; Protozoa.

Dr. Robert H. Wolcott, instructor in zoology, University of Nebraska, Lincoln; Hydrachnida and Insecta.

Mr. Herbert S. Jennings, assistant in zoology, Harvard University, Cambridge, Mass.; fishes and Rotifera.

The following gentlemen who were with the party about a month rendered very valuable assistance in their special line. To some extent they were enabled to examine material collected at other times by various members of the party:

Professor Edwin A. Birge, University of Wisconsin, Madison, Wis.; vertical distribution and Cladocera.

Mr. H. D. Thompson, instructor in natural science, Moline High School, Ill.; plants.

Mr. Bryant Walker, Detroit, Mich.; Mollusca.

It is scant acknowledgment of continued aid and encouragement to say that whatever results the work may have yielded are due to the efforts of these gentlemen. All of them worked under great disadvantages, but with an enthusiasm which begets success, and their best services were offered without compensation in the cause of science. More than this some of them brought to the work of the summer expensive pieces of apparatus without cost of any kind to the Commission. Thanks are especially due to Messrs. Birge, Marsh and Walker for such courtesies. It is only fair to Mr. Thompson, who had charge of the botanical part of the work, to say that he joined the party at a very late date and most unexpectedly, to fill a vacancy, so that he was handicapped by lack of knowledge of the region and of the early work of the party, and was further hindered by poor health during his stay in Charlevoix. In spite of all these disadvantages he did a large amount of work as shown by his report appended hereto.

Valuable assistance in the work of identifying the algæ was given by Mrs. Prudence W. Kofoid. Dr. R. Halsted Ward, Troy, N. Y., was with the party for the last of the season and assisted in the botanical work. After the laboratory closed he voluntarily spent an entire week making collections at various points on the system of connecting lakes in the extreme northern part of the peninsula (see map). These were sent to various members of the staff and were of great value for comparison with the data obtained at Charlevoix. The various stations at which he made collections are indicated on the map by arabic numerals; from these the considerable extent of this assistance may easily be estimated.

The laboratory was honored by numerous visitors, including some scientific men of prominence, who made stays of varying lengths while investigating special problems. Professor W. A. Locy, of Lake Forest University, spent some time there in researches on fish embryology, and Professor C. K. Wheeler, of Michigan Agricultural College, was called to Charlevoix by the discovery of a member of our staff that the Russian Thistle was growing in the vicinity of the laboratory. This was the first reported occurrence of this pest in the lower peninsula. But a small number of plants were found, these in a limited area near the shore and not yet mature. Their timely destruction undoubtedly prevented the species from obtaining a foothold in the region and saved the State a considerable expense for its eradication. Miss Weidemann, of Michigan University, also spent some time in the laboratory, being engaged in the study of various fish fungi.

Mr. Dwight Lydell and Mr. Jesse P. Marks, old and skilled employés of the Fish Commission, devoted their time and energy to assisting the work of the party in various ways. The collections of parasites and of fish stomachs were particularly due to their efforts.

Collections were made and sent to the following persons, who have agreed to report upon the same:

Dr. G. Eisen, San Francisco; Oligochæta.
Dr. R. Blanchard, Paris, France; Leeches.
Dr. W. McM. Woodworth, Harvard University; Planarians.
Dr. C. B. Davenport, Harvard University; Bryozoa.

During the first five weeks the energies of all were devoted to qualitative work on the flora and fauna of the waters. Tows at surface and bottom were taken and examined in the morning, and the afternoon was used for collecting trips to various points. In this way there was obtained a general picture of the life, first in Round Lake on which the laboratory was located, then of Pine Lake and finally of Lake Michigan. Lists were kept of the forms identified, and for this purpose the blank reproduced by Reighard (p. 10) was employed. It should be said that this collective blank, which has been in use for years at the Agassiz Marine Laboratory in Newport, is a form compiled and introduced by Dr. W. McM. Woodworth, of Harvard University. The season at Charlevoix was the second year of its use for lake work, and it has continued to answer its purpose admirably and with very little modification. The blank for recording parasites and that for individual species, given by Reighard (p. 9), were also used at Charlevoix. During our stay it was customary to send some one of the assistants out on fishing tugs from time to time, and to secure in that way specimens of various fish for investigation; the stomach contents of a large number and the parasites of others were obtained and preserved for study.

While the party was thus engaged in recording the mutual relations of the life in the waters, information was secured at the same time as to the character of the waters, of the fishing grounds and of the fish supply. All these were made the basis of the last three weeks work, the quantitative plankton studies, which are treated in detail later.

To the United States Fish Commission, through Commissioner Marshall MacDonald, the party was greatly indebted for the loan of valuable apparatus. At the request of President Whitaker, of the Michigan Board, Mr. MacDonald sent for use in Charlevoix a Tanner deep sea sounding machine* of improved pattern, a Sigsbee water bottle, and a set of Negretti and Zambra deep sea thermometers*, with Tanner improved thermometer cases and accessories. This apparatus was in constant use on our trips; by means of it the depth of all stations was measured, and the temperature of the water taken at bottom and surface. It proved convenient, prompt in action and was invaluable for our work. The only step necessary in rigging it in the fishing tug was to bore a hole of proper diameter in the side rail, fit a step on the deck below to hold the foot and run guy lines in two directions from the apex of the instrument. By a movement of the hand it could be turned out over the rail ready to use or brought back into a resting position. After the return of the apparatus, Commissioner MacDonald had a table constructed for calculating the readings of the register on the sounding machine, and sent the table for use in connection with the records of the summer. The sincere thanks of the party are due to Commissioner MacDonald and the United States Fish Commission for the courtesies thus extended to us.

In connection with the search for young whitefish it was of advantage to have specimens for comparison, and Messrs. Smethurst and Thompson, of Warren, Ind., were kind enough to send a number of specimens raised in their fish ponds. The approximate size of the fish at a certain age, and its general appearance, were known to us in this way. For these specimens sent gratuitously in the interests of fish culture our thanks are due the firm.

While in Charlevoix the party was in receipt of a large number of courtesies from various sources. To acknowledge them in detail would be impossible here. They helped the work materially and aroused in members of the party a friendly feeling towards the place and its residents which will not soon be lost.

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* A detailed description of the apparatus may be found in Report U. S. Fish Com., 1883, p. 57-76, plates 29 to 39.

NOTE.—I feel that an apology is due to the Commission, and no less to the various members in the party for the delay in the appearance of the final report. For this I am alone responsible and can only say that the delay has been entirely unavoidable.

LAKE MICHIGAN.

Lake Michigan stretches from 41° 40′ to 46° 5′ north latitude, and from about 85° to about 88° west longitude; its surface lies at an elevation of about 600 feet above the sea. The lake has the form of an elongated oval extending in general north and south, but the narrower northern end curves decidedly towards the east, so that the western and northern shores form with the continuous shore of Lake Huron a nearly regular semicircle. The extreme length of the lake is about 345 miles; its width is greatest opposite Grand Haven, being there 85 miles and decreasing slightly in both directions, more towards the northern extremity of the lake. At its northeastern end the Straits of Mackinac connect with Lake Huron by an open passage 8 miles wide.

Lake Michigan averages 400 feet in depth, and in some places reaches the extreme of 900 feet or more. Its area is variously given as 22,400 to 25,600 square miles, making the total volume reach 262,500,000 millions of cubic feet, according to one computation.* This enormous volume assures comparative stability of the entire mass since the total inflow, and consequently also the outflow are very small in comparison. It is impossible to measure the outflow on account of the size of the Straits of Mackinac and the variability of the flow in them, which depends upon changes in conditions of wind and weather to such an extent that at times the outlet is the seat of a powerful current setting inwards. The inflow is equally difficult to measure, since the tributaries of the lake are none of them rivers of any size, but innumerable small streams, in which the flow is not only extremely variable at different seasons, but is also in most cases entirely unmeasured.

One method of estimate yields, however, results which show clearly the minimal amount of the change even under the most favorable circumstances. The entire area of the drainage basin of Lake Michigan is given as 70,000 square miles, and according to the same authority† the lake covers 23,400 square miles of that amount, or the area of the entire basin is only three times that of the lake itself. The normal rainfall of the region is given by the tables of the U. S. Weather Bureau as from 32 to 36 inches per annum.‡ A yearly precipitation of 35 inches, which is more than the average for these places and certainly not less than the normal for the entire region, would mean a total of three times that amount, or 105 inches, if all of it were conserved and reached the lake. According to the investigations of Russell (88), the annual evaporation from free water surfaces, in this latitude varies from 20 inches at the head of the lake to 34 inches at its southern end, or about 27 inches for the average of this area. Deducting this and regarding the evaporation from the land and from the streams en route to the lake as *nil*, we find that the level of the lake would be raised 78 inches, or 6½ feet, by the total annual rainfall. Of course the amount of outflow in any single year is dependent on other factors as well as the rise in level by additions from the surrounding country, but on the average the amount gained by inflow and the amount lost by outflow in a single year are equal. The total change in volume during a year is then six and one-half feet; or, on the basis of an average depth of 400 feet, it would require 62 years to change the entire volume of the lake. This is certainly too much, since the loss by evaporation from the land and from streams in transit is a considerable percentage of the total. I am unable to find any definite information as to the amount lost in this way; if, however, it equals one-third the loss from free water surfaces, the deduction for an area equal to the lake would be 9 inches yearly, for double that area 18, which deducted from the figures given above would make the annual gain of the lake 5 feet. This would mean a change of *one-eightieth of the entire volume in one year*. The actual change is probably somewhat less than this Under these conditions one may justly regard the volume of the lake as stable and as such sharply in contrast with those which obtain in those lakes which have hitherto been the object of biological investigation. In Lake St. Clair, which represents perhaps the other extreme, the inflow and outflow are sufficient to change the entire volume of water in the lake in less than six days.

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* Not only do various authorities differ widely in the figures given, but in Reclus (90) from whom these statistics are quoted, there stands in the table, p. 350, area, 25,600, depth 870, elevation 595, while the statistical table of the appendix to the same volume (p. 464) gives the figures as 22,400, 700, and 576.

† Encyclopedia Britannica, IX Ed., article on St. Lawrence.

‡ Green Bay, 33; Milwaukee, 32.2; Chicago, 35; Grand Haven, 35.6 inches. (Report of Chief of the Weather Bureau for 1891-92, pp. 444-5.]

Uniformity of distribution within the lake is brought about by the constant currents. These have been the subject of especial investigations by the U. S. Weather Bureau and the surface currents of the Great Lakes are given in a report by Harrington (95). From the chart of Lake Michigan in that atlas it appears that a general southerly current runs parallel to the west shore, a short distance from it, and a northerly current returns, the length of the lake, close to the eastern coast. In the southern end of the lake these currents form parts of a circular movement of which the upper cross current is below Grand Haven. Somewhat further north a broad indefinite stream sets from the western to the eastern longitudinal currents and near the upper end of the lake a whirling current surrounds the Fox and Beaver Island group. The northerly current does not seem to pass out through the Straits of Mackinac, through which the water runs in both directions at various times and under various conditions of wind and weather, but it is reflected towards the western shore. In velocity the currents vary from at least 4 to 20 miles a day, while in the extreme case it may reach 40 to 90 miles in the twenty-four hours. The movements of these currents produce then a circulation within the lake itself, and constitute an extremely important factor in the distribution of the life in the water. In addition to these regular currents there are also the irregular movements of the water due to winds and the so called tidal waves or *seiches*, both of which contribute to produce uniformity of distribution.

The lake shore presents a great diversity of physical features. At the southern end the shores are flat, sandy and entirely free from outlying islands; towards the north they become higher, rocky and jagged while the sharp promontories are continued into extended reefs and series of islands, some few of which even attain a very considerable size. Along the lower half of the lake the shore is entire or at most faintly indented by long sweeping curves, but northward one finds numerous deep bays and sharp promontories. Two great bays face each other on opposite shores of the lake near its upper end, forming the most prominent breaks in the entire shore, and so located as to apparently balance each other. Green Bay on the Wisconsin shore is somewhat larger than Traverse Bay, its counterpart on the Michigan side, but the latter is noteworthy for its extreme depth. Both of these bays have long been famous fishing grounds, and the waters of the Traverse Bay region still continue to furnish an important part of the whitefish supply. It seemed wise to carry on the work from some central point in this region and Charlevoix was selected as the site for the laboratory. The town (see map) is located on the eastern shore of Lake Michigan, midway between Grand Traverse and Little Traverse Bay. The Beaver Island group which lies to the northwest is connected to the mainland by the "ten fathom" line, which marks out roughly the limits of an old peninsula that made this portion of the main lake a bay in former times. The northward current of the lake already referred to sweeps up through this region and circles around the islands. Though the opening between the islands and the mainland through which it runs is less than ten fathoms (18m.) deep, the path followed from the southward is marked by a sublacustrine valley of considerable depth. Stations xi and xvii which lie about in the line of this depression show a depth of 112 and 130 meters, respectively.

A pier of some length terminated by a lighthouse marks and guards the entrance to a small channel which joins Lake Michigan to Pine Lake, one of the largest bodies of water within the lower peninsula of Michigan. Midway in the course of the stream is Round Lake, a nearly circular sheet of water half a mile in diameter, the shores of which are lined by the docks and crowned by the houses of Charlevoix. Here was located the laboratory at the very edge of the water and within easy reach by boat of both the main lake on the west and Pine Lake on the east (Pl. IV). The advantages of the situation were unsurpassed for the work in hand. The numerous small lakes in the surrounding country afforded every advantage for easy comparison of life in ponds, among which were many well stocked with game fish, with life in larger bodies of water. Pine Lake, with its 96 miles of shore line furnished wide variations in depth and character of bottom, while Lake Michigan in the immediate vicinity presented areas of open water and well protected bays, shallow and deep water, with sand, cobble stone and rocky bottom. There were not wanting areas generally believed to be spawning places for the whitefish, nor fishing grounds of present and past repute, so that it was possible to find within comparatively narrow limits the factors necessary to be compared in attempting to begin the solution of the whitefish question.

I was unable to ascertain the exact length of shore line presented by Lake Michigan and hence could not calculate precisely the absolute and relative shore development. Estimates made from the government chart show that both are decidedly less than the figures given for Lake St. Clair by Reighard (p. 12). The area of shallow water is still further limited by the comparative steepness of the shore. The ten fathom line (18m.), as drawn on the chart, leaves an extremely narrow margin of shallow water; and yet the limit set by this line is three times that of the deepest point in Lake St. Clair. The influence of the limited shore line and of the insignificant shallow littoral region on the conditions of existence will be discussed elsewhere in the report.

FLORA AND FAUNA.

In general it may be said that the number of species found in the waters of the Charlevoix region was not so great as from Lake St. Clair the year before. Reighard reports a total of 623 species from the latter place, while the total number recorded from Charlevoix was only about 500, although an equally careful search was made. The most noticeable difference, in the number of species of plants recorded, was due in part to the short time which Mr. Thompson spent in Charlevoix. Some facts of importance concerning the various groups may be recorded in this connection.

PLANTS: Of the larger plants so abundant in Lake St. Clair and in the smaller inland lakes it was evident at an early period in our work that their relative scarcity exercised an important influence in limiting the littoral fauna of the lakes. Reighard shows that the yield of the larger plants in a lake is dependent upon the amount of shallow water. To this may well be added as a second important factor the permanency of the shore, the littoral area. If, owing to storms or currents, the bottom of the shallow area is continually shifting, or if the beach is disturbed at each storm by the heavy waves rolling in from the deep water, there is little chance for the development of shore plants or such as grow in shallow water. And as a matter of fact the only considerable bed of larger plants which was encountered in Lake Michigan, occurred in the sheltered High Island Harbor. (Pl. V, station xv.)

These two factors serve to explain the limited development of the larger plants in the Charlevoix region, and the casual visits paid by members of the party to inland lakes in the vicinity which resulted in the discovery of much crowded masses of shore and bottom vegetation in those smaller and shallower lakes, go to strengthen the force of the conclusion. I do not feel sure that the deficiency in the group of filamentous algæ noted by Mr. Thompson in his report appended to this paper, can be explained on the same ground alone, but certainly these factors are of some importance in this connection also.

Among microscopic plants Mr. Thompson calls attention also to the entire absence of Desmidiæ* from the waters of Lake Michigan and also from those of both Round and Pine Lakes. The Diatomaceæ were, however, extremely abundant, both in species and in individuals, and were according to Mr. Thompson's observations most plentiful in the deep towings. This may be due possibly to the great transparency of the water. A more detailed account of the plants, together with a list of the species determined and data on the distribution of various forms may be found in the report of Mr. Thompson (Appendix I, p. —). The amount of material collected is actually very large if it be remembered that Mr. Thompson was called in at a late date to fill a vacancy in the party, that he was able to be with us only a few weeks, at the end of our stay in Charlevoix, and that he had to contend with numerous difficulties apart from the brief time at his disposal.

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* Two species of rare occurrence were recorded at the laboratory during the summer.

In addition to those found by Mr. Thompson, the following species of microscopic plants were recorded at the laboratory during the summer.

Anabaena flos-aquæ Kg.
Cocconeis transversalis Greg.
Cyclotella operculata K.
Eurastrum inerme Lund.
Gomphonema acuminatum Ehr.
Merismopidia convoluta.
Navicula major K.
maxima.
producta S.
Pediastrum beryanum.
Stephanodiscus niagare E.
Treyblionella scutellum Smith.

ANIMALS: The following notes on various groups of animals are deserving of special mention or of particular explanation in this connection. A list of the groups represented in fresh water, together with the common names of these groups is given by Reighard (p. 16).

Protozoa: A very full report on this group by Dr. C. A. Kofoid is appended (p. –) These forms constitute one of the chief elements of the plankton, furnishing as they do the simplest animal food and being one immediate source of food for the smaller crustacea which in turn become the prey of various fishes, they are an exceedingly important factor in fish economy. This was pointed out by Ryder (81), who, however, regarded the Protozoa only as an *indirect* source of the food of fishes. They are indeed important from this standpoint alone; but the work of Peck (94) establishes the value of the Protozoa and Protophyta of the plankton in one case at least, as a direct source of food supply also. Thus far no fresh water fish is known to have similar habits, but investigations should be made as to whether the same is not true to some extent at least of our lake herring. It is interesting to note the confirmation in Dr. Kofoid's report of the absence of a littoral zone, and the freedom from shore mixtures of Lake Michigan plankton, as shown by a study of the protozoan representatives. The number of species which are characteristically limnetic is large here, being eighteen for Lake Michigan, as compared with thirteen in Plöner See and seven in Lake St. Clair. These forms are widely distributed and none of the species seem to be exclusively characteristic of this region. The list of species would have been considerably extended, except that our attention was confined chiefly to a study of the plankton, while collections from the shores and from the inland lakes were obtained only casually.

Coelenterata: No fresh water sponges were found in the lakes at Charlevoix. Both the white and the green *Hydra* were met with occasionally in bottom tows. Their comparative rarity is unquestionably due to the scarcity of vegetation to which they ordinarily attach themselves, since in the collections brought back from the inland lakes north of Charlevoix by Dr. R. H. Ward they were exceedingly numerous. In some bottles from that region the white *Hydra* was found in such numbers as to constitute the bulk of the material in the entire haul.

Worms. *a.* **Turbellaria:** (Non-parasitic flat worms.) The following species were found on algæ collected from the old channel, Round Lake:

Mesostoma viviparum Silliman.	*Microstoma lineare* Or.
Vortex sp.	*variabile* Leidy.

An unidentified form occurred once or twice in the bottom tow and four vials of specimens were set Dr. W. McM. Woodworth for identification. He reports two species found in the vials, *Vortex armiger* O. Schmidt, and *Mesostoma* n. sp. described later in this report together with other data on this group. (App. IV.)

b. **Parasitic Worms:** A total of 1410 parasites were obtained from 115 specimens representing eighteen species. These included *Coregonus artedi*, *C. clupeiformis*, *C. prognathus*, *C. quadrilateralis*, and *Salvelinus namaycush*. The whitefish and trout were in some cases badly infested with tapeworms and *Echinorhynchi*; but on the average there were fewer parasites than in the fish from Lake St. Clair examined the year before. A single free specimen of *Mermis* and a few of *Gordius* were taken from Round Lake and Lake Michigan respectively.

c. **Oligochaeta:** These worms were not so frequently met as in the Lake St. Clair work. A small collection, comprising 6 vials of alcoholic specimens, was sent by Dr. Eisen for identification. The relative scarcity was due no doubt to the scanty littoral and bottom vegetation, on which they are commonly abundant and from which certain species were collected in large numbers in Lake St. Clair.

d. **Hirudinea:** The leeches were represented by several very large species, and numbers of other forms, all of which are in the hands of Professor Raphael Blanchard, who will make a report on them in detail. One very interesting striped form, *Ichthyobdella punctata* Verrill, was present in large numbers on the fish lifted in gill nets. They attack mostly whitefish and are found in abundance. Thousands are strewn over the nets, boxes, and even the deck itself when the seine is hauled in.

e. **Bryozoa:** In dredgings made on the Middle Ground, Traverse bay, at a depth of from 23 to 36 m., a considerable number of colonies of these forms were collected. With them were dredged scanty filamentous algæ. The Bryozoa were submitted to Dr. C. B. Davenport, of Harvard University, who very kindly determined them. He reported that *Paludicella Ehrenbergii* van Ben. and *Fredericella sultana* Blumenbach, were abundantly and typically represented in the mass sent him, and that the stocks were evidently living when found. *Cristatella mucedo* Cuv. was represented by a part of a statoblast only which had undoubtedly floated down from a higher level. The first two species are an interesting addition to the deep water fauna of the lakes, and I think the deepest recorded occurrence of Bryozoa in fresh water. Agassiz ("Three Cruises of the Blake") records marine forms from a depth of nearly 900 m.

The forms mentioned above were also obtained from "honey comb" rock brought up in gill nets from about the same depth in the vicinity of the reef between Charlevoix and Beaver Island. (See map, station ix).

f. **Rotatoria:** These forms constitute an important part of the microscopic fauna of the lakes. One hundred and ten species were reported in 1893 from Lake St. Clair. Last summer only ninety-four were found in the entire Charlevoix region, and but fifty-eight of these occurred in Lake

Michigan or in the immediately connecting waters of Round and Pine lakes. The limnetic (pelagic) species were well represented, being in number only three less than the true limnetic species of Lake St. Clair, but the absence of shore and bottom vegetation precludes the development of the large number of littoral and bottom forms found in smaller and shallower lakes. Thus only eight bottom species in all are reported from Lake Michigan. Mr. Jennings, in his report on these forms, printed as an appendix, calls attention to some biological facts of great interest, such as the accumulation of the Rotifers near the surface in the day time and the rapid variations in the number of individuals and in the ruling species of the plankton. Out of the ninety-four species recorded twenty are new to Michigan and one new to science.

Crustacea: Of this class the following orders were represented in material obtained at Charlevoix. These forms constitute the most important element of fish food and are found in large numbers in the shore, the bottom and the limnetic faunæ.

a. **Cladocera:** Between twenty-five and thirty species of these forms were taken at Charlevoix. They were most abundant in the smaller inland lakes, no less than twenty species being recorded as the result of a half day trip to Twenty-Sixth lake. In the larger lakes they form a less important element of the faunæ. No detailed report on the number or frequence of these forms has yet been made.

b. **Copepoda:** A special report on this group has been published (Marsh, 95), from which a few quotations are made here. "From the standpoint of the pisciculturist, perhaps no class of animals outside the fishes themselves is so important and interesting as the Entomostraca. It is a well known fact that these minute crustacea form the entire food material of the young of some of our most important food fishes, and in many cases constitute a large part of the food of the adults."

With reference to the representatives of this group in the Charlevoix region, Marsh says (p. 4), "It is interesting to note the greater richness of the copepod fauna of our lakes as compared with those of the continent of Europe. Zacharias finds seven species of copepods belonging to the Cyclopidæ and Calanidæ in the Plöner See. In Lake Michigan there are nine, and that includes no littoral species; in the two lakes on Beaver Island there are eight, in Pine Lake nine in Round Lake eleven, in Intermediate Lake eleven, and in Lake St. Clair sixteen. The larger number in Lake St. Clair is probably explained by the fact that, being very shallow, it has the species of the smaller bodies of water and of the stagnant pools, and in addition, because of its connection with the Great Lakes, has also their limnetic species.

"Pine Lake is peculiarly poor in its number of species; this is strikingly apparent when we compare it with Intermediate Lake. Pine Lake was very thoroughly examined, and it is likely that we are acquainted with all the species occurring there, and yet the number is only eight. All the collections from Intermediate Lake were made in one day by a party which went down from Charlevoix and remained only a few hours, and yet the number of different forms is eleven. Intermediate Lake seems to be an usually rich collecting ground, for, with the exception of Lake St. Clair and Round Lake, no other lake shows such a large number of species, and both Lake St. Clair and Round Lake have been very thoroughly explored. Moreover, in the case of Round Lake, several of the species may be considered as immigrants from Lake Michigan."

In a letter of recent date Professor Marsh says:

"There are no characteristic species in Lake Michigan at Charlevoix, as the fauna of the Great Lakes is, so far as I can make out, identical. Lake St. Clair has some stagnant water forms in addition to those commonly found in the lakes. From the stations about Charlevoix I have 17 determined species. There was besides at least one species of *Ergasilus*, one or more of *Canthocamptus*, and the parasitic forms which I have not worked out at all."

In the report referred to above are given a table of distribution and keys for determining the various species in the groups which are found in Michigan. For further details the original should be consulted.

c. **Ostracoda** are not uncommon in Round and Pine lakes, they are not, however, sufficiently numerous to be an important element of the plankton. The species obtained have not been determined as yet.

d. **Amphipoda:** There are two species of amphipods which are characteristic in their distribution. *Hyallella dentata* Smith is found in large numbers along the shores of Round Lake (Pine Lake?), and the inland lakes. It was not reported from Lake Michigan though it may well be present in the immediate vicinity of the shore. In deep water its place is taken by *Pontoporeia Hoyi* Smith which came up in every haul of the dredge, and was frequently present in enormous numbers. This species forms one of the chief sources of food for various species of whitefish. (See p. 21.)

e. **Podophthalmia:** The Stalk Eyed Crustacea are represented by shrimp-like forms and by the crayfishes. A single species of the first, *Mysis relicta* Lovén, occurs in Lake Michigan in deep water; from 24 to 130 m. (the deepest station) it was abundant everywhere that we tried the dredge. On one occasion a bottom tow with the runner net brought up a large number of individuals which were kept alive in a pail for a time, but soon died, perhaps on account of the rise in temperature of the water. They are among the most transparent and active of fresh water Crustacea and yet furnish much the largest percentage of whitefish food afforded by any one species (see tables p. 21). For themselves they appear to rely largely upon the Copepods of the plankton for food. In spite of their abundance we did not take a single immature form in our nets.

Two species of crayfish, *Cambarus propinquus* Ger., and *C. virilis* Hagen, were found both in the main lake, and in the connecting waters of Round and Pine lakes These species came up in large numbers on the gill nets of the fishermen and were taken in the trawl as well as caught in shallower water along shore. They furnish an important element of the food of the larger fish.

Hydrachnidæ: The water mites seem to be very abundant at Charlevoix. With reference to the group Dr. Wolcott reports:

"Of Hydrachnidæ, to which very careful attention was devoted, owing to personal interest in the subject, 43 species were taken belonging to 16 genera; of these 23 species and 4 genera were not represented in the collection from Lake St. Clair. Numerous specimens of a mite identified in the previous collection as a species of Oribatidæ, were also obtained."

Insecta: A disappointingly small number of forms both in species and individuals was found in Charlevoix waters. The absence of the littoral and bottom vegetation, which in Lake St. Clair afforded shelter and support to a host of larvæ, evidently accounts for the deficiency in this respect. That this was clearly the cause became apparent on the cursory examination of the smaller inland lakes of the region which sheltered among the littoral and bottom vegetation countless larvæ. No attempt was made to collect or include in the list these forms from the smaller lakes. With the scarcity of insect larvæ goes hand in hand the absence of those fish which depend largely or entirely upon these forms for food, and which were abundantly found in Lake St. Clair. Dr. Wolcott listed 77 species from Charlevoix, determined as follows: Odonata 9, Ephemeridæ 7, Perlidæ 1, Phryganidæ 13, Hemiptera 6, Coleoptera 18, Lepidoptera 8, Diptera 20, and adds concerning them "To these must be added a number of species of aquatic habits during a whole or part of their existence which were, however, collected not in towings or dredgings, but only in the adult state; these are sufficient to bring the total list of aquatic forms observed up to considerably over a hundred. It was to be expected that the experience of the previous year at Lake St. Clair would have rendered possible the collection of a still larger number of species, but the conditions were to some extent unfavorable. Both Pine and Round Lakes, deficient as they were in vegetation, exhibited an equal deficiency in the number of species of insects, although the latter were present in considerable numbers wherever vegetation occurred, as it did at some points. Shallow pools along the shores of Pine Lake supported an abundant fauna, but since they hardly came within the territory embraced in the scope of the party's work, no extensive collections were made from them."

"Dredgings from Lake Michigan in moderate depths, especially when over-beds of *Chara*, etc., brought to light a considerable number of insects which were in no wise peculiar. Very interesting, however, was the occurrence on one occasion of a species of *Nemoma*, one of the Perlidæ, in the deeper parts of the lake in the vicinity of Charlevoix."

Mollusca: This group was very thoroughly studied by Mr. Bryant Walker whose report is found in appendix V. I would call attention here to his remarks on the scarcity of the large bivalves which are an unimportant element of fish food and the universal abundance of the smaller forms, both univalves and bivalves, which constitute so important a factor in the food supply of the lake fish. (See tables p. 21). While Mr. Walker calls especial attention to the large number of forms found in beds of *Chara*, it is equally true that the surface of the boulder covered areas of bottom, so plentiful a short distance off shore in that part of Lake Michigan appears peppered with small snails; and together with crayfish they constitute the chief animal forms taken in dredgings in this region. These univalves subsist in large part on the minute algæ derived from the plankton, while the bivalves are entirely dependent upon this source for their food supply. Here there is then but one intermediate stage between the life of the plankton and the whitefish. Mr. Walker also notes the poverty of the molluscan fauna in Pine Lake. Details with reference to the various species and their distribution are to be found in the appendix. It is not too much to say that no group was more thoroughly and accurately worked up than this and the importance of these data for the whitefish investigation is apparent on examination of the tables of whitefish food, already mentioned.

Vertebrata: Water birds are not as common on the lake as they were at Lake St. Clair and turtles were found only in the smaller inland waters. Amphibians were not noticed in Lake Michigan at all and were rare in the other waters examined. Only a single specimen of the "mud puppy" (*Necturus maculatus* Raf.) was found, and that in the old channel between Round and Pine lakes. This species is extremely abundant in Lake Erie and Lake St. Clair and destroys an enormous number of white fish eggs, the Necturi taken in the Detroit river in the fall being gorged with the freshly laid eggs. The apparent rarity of the form further north is hence fortunate.

The following list shows the species of fish taken in various places as indicated: C, old channel between Round and Pine lakes; M, Lake Michigan; P, Pine Lake; R, Round Lake, (Pl. IV). The list is by no means complete since particular attention was paid only to the important food fish and to smaller forms captured by chance in the search for young whitefish. The identification of the smaller forms was made by Mr. Jennings, while we worked together on the various species of *Coregonus*. We had determined the Lake Michigan "Long Jaw" as an undescribed species, and it was only in the fall that on receipt of the paper by Smith (94) I saw it was identical with his species *C. prognathus.*

Scientific Name.	Common Name.	Locality
Ambloplites rupestris (Raf.)	†Rock bass	R.
Ameiurus melas (Raf.)	†Bullhead	C.
Catostomus teres (Mitch.)	†Sucker	P.
Coregonus Artedi LeS.	†Lake Herring	M.
clupeiformis (Mitch.)	†Whitefish	M.
quadrilateralis Rich.	†Menomonee	M.
(*?*) *tullibee* Rich.	Long Jaw (?)	M.
nigripinnis (Gill.)	†Blackfin	M.
prognathus H. M. Smith	†Long Jaw of L. Michigan	M.
Cottus Richardsoni Ag.	*Miller's Thumb	M. R.
Etheostoma nigrum Raf.	*Sand Darter	M. R.
caprodes Raf.	*Log perch	M.
Eucalia inconstans (Kirtland)	*	M. P.
Lota lota (L.)	†Lawyer	M. P.
Micropterus dolomieu Raf.	Small mouth Black Bass	R.
Notropis deliciosa (Gir.)	*	C.
megalops (Raf.)	†Common Shiner	R.
Percopsis guttatus Ag.	*	M.
Perca flavescens (Mitch.)	†Perch	R.
Salvelinus namaycush (Wal.)	†Lake Trout	M.

Names after Jordan, Manual of the Vertebrates, fifth edition, Chicago, 1890.

Half a dozen species of young fish or small forms are yet unidentified. If these and the fish taken in the smaller inland lakes were both added the list would be considerably extended.

The food relations of the various forms listed in the foregoing can not be given at present in more than general terms. For a discussion of this subject and a valuable table expressing some of these relations in synoptic form the reader is referred to Reighard (93, pp. 23 and 24).

One striking faunal peculiarity appears on examination of the preceding account of the various groups to be generally characteristic not only of Lake Michigan, but also in great part of Round and Pine lakes. It is the absence of the littoral flora and fauna. The abundance of life which characterized the shore region on Lake St. Clair is here entirely lacking.

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*Taken in trawl in various localities.
† Examined for food and parasites.

It may well be that all other deficiencies are due to the absence of littoral vegetation, the reasons for which have already been discussed. At any rate, the barrenness of the littoral zone eliminates from the question of the food supply of this region one element which in Lake St. Clair was of extreme importance.

Mention has been made of the limited bottom vegetation and of the absence of certain forms of animal life ordinarily found in connection with the plants of the bottom. This matter will be discussed further in another part of the report. Here may be recorded merely the limited development of this source of food supply in this part of Lake Michigan.

To one small group of forms, the various species of whitefish, particular attention was paid and the results of this study are embodied in a special section of this report.

THE WHITEFISH.

Eight species of *Coregonus* are known to occur in the Great Lakes; they are the common or true whitefish, *Coregonus clupeiformis* [Mitch.], the "blackfin" *C. nigripinnis* [Gill], the "long jaw," *C. prognathus* H. M. Smith, the lake herring or cisco *C. Artedi* Le Sueur, the tullibee or mongrel whitefish, *C. tullibee* Richardson, the Menomonee whitefish, *C. quadrilateralis*, Richardson, the "Soo" whitefish or whiting, *C. labradoricus* Richardson, and the Lake Michigan cisco or the lake "mooneye" *C. Hoyi* [Gill]. The last four from their rarity or small size, are of little importance commercially, and only one of them the Menomonee whitefish, was seen at Charlevoix. All of the first four, however, were obtained there, and the first three were the object of especial study. They are the species ordinarily marketed and are sold indiscriminately under the name whitefish, although the fishermen distinguish them easily. In fact the "long jaw" was constantly picked out for us as a distinct form by the fishermen, and after numerous efforts to make it fit the description of some known species, Mr. Jennings and I were forced to admit its distinct character. Early in the fall the paper by H. M. Smith (94) fell into my hands, and the identity of the Charlevoix form with the new species described therein was at once apparent.

The habits of the whitefish are only meagerly described in our literature. Since Milner (74) nothing more than scattered details have appeared, and a good account of the biology of this group is yet to be written. The work at Charlevoix was not extensive enough to add greatly to our knowledge; there are, however, some observations of value made there which may be recorded in this place.

The horizontal distribution of the four species is, so far as our observation extended, uniform; but the vertical limits seem to be very different. This is mentioned in the work of Milner, but our own observations, and also the reports of the best fishermen, seem to indicate even a more definite location for each species. It seems that the lake herring is a surface fish and is taken in gill nets only near the surface; the true whitefish is caught in water as shallow as twenty feet, but is most common between twelve and twenty fathoms. The long jaw is rarely found in twelve fathoms; it is, however, abundant in depths of from twenty to twenty-five fathoms, but does go somewhat deeper, while the blackfins are rarely met in less depth than forty fathoms. This vertical distribution is so definite and so well known that the catch of a gill net at any given depth may be predicted with considerable accuracy. It is the summer range of the fish and is modified at the spawning season. One naturally suggests temperature as the ruling cause for this vertical limitation of distribution, since, as will be seen later, the food of these various species has a much wider vertical range than the species itself, and since the accounts given by fishermen of the winter limits of the species correspond in general to the temperature changes. This matter should be the subject of special study during the entire year in connection especially with accurate and extended observations on the temperature of the water.

In the next place our entire knowledge of the food of the young whitefish, and in fact all other information with regard to the fish in the first year of its life, depends upon inference. Forbes (82) has furnished the only experimental information on this subject. He placed several thousand whitefish fry in a tank fed by Lake Michigan water and supplied them with an abundance of organisms obtained from the lake by a tow net. From this, which is identical with the plankton mentioned elsewhere in this report, the fry selected chiefly small Entomostraca. Forbes says (p. 781), "The entire number of objects appropriated by the sixty-three fishes [out of 106 examined] was as follows: *Cyclops Thomasi*, ninety-seven; *Diaptomus sicilis*, seventy-eight; *Anuræa striata*, twenty-nine; *Daphnia hyalina*, one." From this he concludes that "the two species of Copepoda, *Cyclops Thomasi* and *Diaptomus sicilis*, are certainly very much more important to the maintenance of the whitefish in the early stage of independent life than all the other organisms in the lake combined." Interesting and valuable as these experiments are, it should be noticed that the evidence is not complete. The fact that in captivity the fry eat these two species in particular is no proof that in nature their food is the same. In the Agassiz Marine Laboratory at Newport I have easily reared young toadfish, a pure bottom fish, on the small crustacea of the plankton. It would be hardly safe on this evidence to regard the young toadfish as normally plankton eaters; the probability is that the natural food of the young was substituted by nearly related forms of *approximately the same size.* Forbes notes that the *Cyclops* was the smallest of all the Entomostraca in the plankton and that the *Diaptomus* was the next in size. This is also the order of preference expressed by the whitefish fry as shown by the number of each species eaten. Reighard (94, p. 40), expresses the opinion that the whitefish fry are more probably bottom feeders. If so, their natural food will then be some of the small bottom crustaceans of no doubt approximately the same size as the two just mentioned, most likely closely related species, but not these forms which are limnetic in character. The nature of the first food of the whitefish fry was clearly demonstrated by Forbes in the discovery of the pharyngeal teeth, which are wanting in the adult, and which point unmistakably to the carnivorous habits of the young. They prey undoubtedly on the Entomostraca; the exact species on which they subsist, however, yet remain to be established.*

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*The matter can only be determined experimentally and I am informed by correspondence that the Michigan Fish Commission, during the past spring, has carried out a series of experiments by planting the fry in boxes supplied with gauze gratings. The boxes were anchored in favorable localities at the surface and near the bottom and a certain number of the fry taken periodically and examined for food. The results of these experiments may well be awaited with great interest.

It was the hope of those interested in the work at Charlevoix that some of the young whitefish hatched in the spring might be caught, and thus evidence furnished as to the food and habitat of the fish during the first year of its life. At the very beginning of the stay an assistant was set to scouring the shores, inlets and shallow places in order to catch all the young fish which could be found; a large number of different species was collected, but none of the whitefish family. A trawl was constructed and used on all of our August excursions into Lake Michigan with the fishing tug. It was tried in waters of various depths and over all bottoms where it could be run and was successful in obtaining a number of species of small fish from these localities (see list on page 17), but no whitefish. The bottom of Lake Michigan in the Charlevoix region is not very favorable for the use of a trawl, as even the stretches of sandy bottom are strewn with occasional boulders, and in the course of our work the trawl was first lost and recovered only after a long search, and finally on the following day torn to pieces. In future work a fine meshed silk gill net would, I believe, be more likely to succeed in catching the young whitefish.

During severe storms young fish are thrown up on the beach of Lake Michigan near Charlevoix, and from this source we obtained immature specimens of the lake herring, of the Menomonee and probably of the long jaw, but none of the true whitefish. The specimens were from three to five inches long and were as small as any ever obtained there. They were probably fish which had been hatched in the spring of that year. The absence of young whitefish in spite of the large catch of the adult fish at this point shows either that the young are more limited in their distribution than the adult and hence are not found at this point, or that they live deeper than the young of other species mentioned and thus are not affected by the wave action in time of storm. Some account of the food of the adult whitefish is given by Milner (74, p. 44) and Smith (74). The number of specimens reported was small, and also the importance of each element in the total amount was left unnoted; furthermore the food of the allied species has received no attention. Hence it seemed wise to devote careful attention to this point and ascertain as exactly as possible the character of the food and amount of each element in it for each of the species of whitefish. A large number of stomachs of whitefish were examined and the results of this study are expressed in the following tabular forms. The specimens examined were from widely separated fishing grounds, representing more than the limit of territory covered by the map of the Charlevoix region given in this report (Pl. V). In the identification of the species of food animals, all the members of the laboratory force participated, and the estimated percentages were similarly controlled so that every effort has been made to reduce the error of such observations to a minimum. The first table presents the results of observations on the food of the true whitefish.

Name of food animal.	Specimens of *Coregonus clupeiformis* examined.														Av.
Mysis relicta Lovén	95	70	----	70	5	----	5	----	----	35	----	----	----	----	20
Pontoporeia Hoyi Smith	----	5	30	----	----	95	85	85	65	----	80	70	90	*	43
Eurycercus lamellatus	----	----	----	(*1*)	----	----	----	----	----	----	----	----	----	----	----
Total Crustacea	95	75	30	70	5	95	90	85	65	35	80	70	90	*	63
Limnæa catascopium Say	----	----	----	----	----	----	----	----	----	----	----	----	----	(*10*)	----
sp. (*juv.*)	----	----	----	----	----	----	----	----	(*1*)	(*4*)	----	----	----	----	----
Physa sp. (*juv.*)	----	----	----	----	----	----	----	----	----	----	----	----	----	(*8*)	----
Planorbis parvus Say	----	----	----	----	----	----	----	----	----	----	----	----	----	(*10*)	----
Amnicola limosa Say	----	----	----	----	----	----	----	----	----	----	----	----	----	(*8*)	----
lustuca Pils.	----	----	----	----	----	----	----	----	----	----	----	----	----	(*2*)	----
porata Say	----	----	(*1*)	----	----	----	----	----	----	----	----	----	----	----	----
Valvata sincera Say	----	----	(*5*)	5	----	----	----	----	----	10	----	5	----	10	2
tricarinata	----	----	----	----	----	----	----	----	----	----	----	(*1*)	----	(*1*)	----
Sphærium striatinum Lam.	----	----	----	----	55	----	----	----	----	----	----	(*1*)	----	(*8*)	4
n. sp.	----	----	(*1*)	----	----	----	----	----	20	(*1*)	----	5	----	10	3
Pisidium (several species)	(*8*)	5	60	15	35	2	1	----	10	35	(*1*)	10	----	60	16
Total Mollusca	*	5	60	20	90	2	1	0	30	45	*	20	0	95	26
Chironomid larvæ	*	8	5	5	*	3	8	10	*	*	15	*	5	----	4
Hydrophilid larvæ	----	----	----	(*1*)	----	----	----	----	----	----	----	----	----	----	----
larvæ	----	----	----	----	----	----	----	----	----	----	2	5	----	----	----
Total Insecta	*	8	5	5	*	3	8	10	*	*	17	5	5	----	5
Small fish	----	12	----	----	----	----	----	----	----	15	----	----	----	----	2
Fish eggs	----	----	----	----	----	----	----	----	----	----	(*6*)	----	----	----	----

1, 3, 5, etc. = percentage of each form in total food mass estimated from volumes.
(*1*), etc. = number of individuals found constituting always less than 5%.
* = trace, or a few specimens, constituting a small uncertain amount or less than 1% of total.

In addition to objects mentioned small brown stones were very common, and in instances formed one-fourth or one-fifth of the total mass; they were not included in the percentages as they did not seem to be a part of the food proper. A trace of filamentous alga (*Cladophora*) was frequently encountered in the stomach contents where its presence was apparently accidental. A considerable number of stomachs were examined which were empty, or in which digestion had proceeded so far that the computation of percentages was uncertain. Both classes are omitted from the table, although so far as could be seen the latter would not have modified the results appreciably.

Summarizing the results given in the table it will be seen that among these fourteen specimens

Pontoporeia constitutes from 0 to 95 % of the total food, averaging 43 %.
Mysis " " 95 to 0 " " " " " " 20 %.

The two forms seem not to be found together in considerable amounts, but the presence of the one indicates the absence, or at most, presence in a trace of the other, making thus the average percentage of crustacean food 63. This alternation seems to indicate a difference in the distribution of the two forms so that the whitefish are likely to find one or the other, but not both on the same feeding ground.

This element is never entirely absent, and, on the other hand, forms two-thirds or more of the entire food mass in ten cases out of fourteen. It is clearly not only the most important element of the food, but is on the average more prominent than all others put together.

Pisidium constitutes from 0 to 60 % of the total food, averaging 16 %.
Sphærium " " 0 to 55 % " " " " " 7 %.
Valvata " " 0 to 10 % " " " " " 2 %.

Other species of mollusks are present in varying small amounts, making the total amount of food furnished by these animals on the average 26%. In three cases out of fourteen this was the bulk of the entire food, and in two instances it was entirely lacking.

The insect larvae, chiefly Chironomids, are a small though comparatively constant part of the food, constituting at most only 15%, and on the average about 5% of the whole. The two cases in which small fish were found, suffice to make this element average 2% of the whole. Whether it is constantly even such a small percentage of the total could only be told by a much greater number of cases; but the percentages of other elements are probably correct within a small amount. It is interesting to notice that only one of the fourteen fish had enjoyed such a mixed diet that no element predominated in its food.

The considerable part played by the mollusks and insect larvæ, both of which are strictly bottom forms, shows that the common whitefish is to a large extent a bottom feeder. This view is strengthened by the down pointed sucker-like mouth of the fish as well as by the presence in the stomachs of numbers of small stones, which were undoubtedly snapped up with some morsel of food.

Of the six specimens of the long jaw (*C. prognathus*), which furnished stomach contents sufficiently undigested to be estimated, five contained *Mysis relicta*, constituting respectively 95, 95, 95, 98 and 100% of the total mass, or an average of 97%, while in the sixth *Pontoporeia Hoyi* was equally abundant. No other recognizable object was present in any of the fish examined. Smith (94, p. 10), in his description of this new species, is able to give only conjectural information as to its food. The stomachs examined do not bear out his surmise that "its larger mouth and more powerful jaws indicate a somewhat wider range of food than is possessed by the common whitefish." Nor do I think that such is the case; its deeper habitat favors a more simple diet since the fauna of the region is more limited in number of species. Again, the anatomical characters referred to find their explanation equally well in the hunting habits of the fish; its food is captured in motion and not on the bottom, hence the strictly bottom forms in the food of the common whitefish, the mollusks and insect larvæ, as well as those accidental inclosures, algæ and stones, are entirely wanting. This difference in the mode of life of the fish, which seems to me adequately indicated by the facts given, is of importance in another connection, as will be seen later.

Only two specimens of the blackfin afforded identifiable stomach contents; *Mysis relicta* was here 95 and 99% of the total amount; one of these specimens yielded a single individual of *Diaptomus* sp., whose presence was perhaps accidental; otherwise nothing was recognized.

Collections of parasites were made from all the species of whitefish obtained at Charlevoix; occasionally individuals were found badly infested with a species of *Echinorhynchus*, but as a whole these fish were very free from parasitic infection.

The question of the decrease of the true whitefish has attracted much attention during the last ten or fifteen years, and the cause has been a matter of considerable dispute. I believe we are in position to offer positive evidence on the question. The fact of the large decrease in the whitefish catch since 1880 is, I think, unquestioned at present, although there is evidence of yearly fluctuations in the catch both before and since that time. The present scarcity of the fish may be due (1) to disease, (2) to scarcity in food supply, (3) to migration, (4) to the crowding out or supplanting of the true whitefish by some other species, (5) to over catching. The first may be dismissed without further discussion since any disease widespread enough to cause such a result would surely have come to the notice of fishermen.

The three most important elements of the whitefish food are *Pontoporeia*, *Mysis*, and the small mollusks. At nearly all of the stations where hauls were made with the vertical plankton net (see Pl. V) the dredges and other nets were also used. Among their contents the three forms just mentioned were the most common of all objects; so much so indeed that their absence in rare cases was noteworthy. Thus, for example, in my notebook is entered for station ix: "Dredge out 5 minutes. Noteworthy—*Mysis* wanting, mollusks almost, very few *Pontoporeia*; according to Capt. O'Neil this point (middle of w. side reef) has *no* whitefish." The immediate food of the whitefish is present at nearly all points and in large quantities, hence the decrease in whitefish supply can hardly be due to this cause. So far as migration is concerned, it might be invoked to explain a deficiency in the catch in a single locality, but statistics now at hand show the decrease to be general and not confined to a single region.

In his recent paper Smith (94, p. 11) suggests an interesting theory as to the possible cause of the disappearance of the common whitefish; namely, that it has been crowded out by the long jaws. It is a well known biological fact that in the struggle for existence one species is supplanted by another more favored form which takes possession of its home and food supply and literally crowds it out of existence. This is most likely to occur between closely related forms in circumscribed areas, and it would appear at first thought as if this were a very probable instance of such supplanting. It is also a curious fact that the same idea occurred to me in Charlevoix and was discussed with at least one member of the party, Mr. Bryant Walker, before the appearance of Smith's paper. In the course of further study, however, I became convinced that the idea was untenable and that the competition between the two species was more apparent than real; in other words that this could not be the cause of the diminishing whitefish supply. The reasons for this conclusion may be given briefly. In the first place the range of the two fish is radically different; long jaws are rare at twelve fathoms where the best catches of whitefish are made, and conversely whitefish are not found at the depth of twenty to twenty-five fathoms where the long jaws are most abundant; nor could I find evidence of any change in range of the species during the last twenty-five years, if one will accept the testimony of the best fishermen. Again, the food of the two forms is somewhat different, as noted above, and more still the place and manner of feeding I have already pointed out that the whitefish is probably a bottom feeder, and that the long jaw is not, but obtains its food more probably free in the water. Furthermore, if crowding out were the cause, the grounds formerly occupied by whitefish must now be preempted by long jaws. It can be positively stated, I think, that such is not the case. As is noted elsewhere in connection with the plankton studies, we examined especially those regions which had been good whitefish grounds, but now yielded little or no catch. In all of the places whitefish food was plentiful, though the grounds were now practically deserted by *all* fish, and many of them were much too shallow for long jaws.

The apparent coming in of the long jaw and the increase in its catch are really due to very different causes. The failure of the shallow whitefish grounds forced the fishermen little by little to move their nets into deeper waters and so gradually to increase their catch first by the addition of long jaws and then by the still deeper living blackfin. These two species are only apparently new arrivals, and their supposed increase at the time of the whitefish decrease is due merely to changed methods of fishing. In this connection it is interesting to notice the testimony of Capt. John O'Neil of Charlevoix, that the long jaws themselves are less frequent in Traverse Bay than formerly, that they are smaller in size and more scattered.

We are thus forced to the conclusion that the decrease in the whitefish supply can have no other cause than overcatching. This is not the place to discuss good and bad methods of fishing or remedies for the trouble. Our investigations point unmistakably to the cause of the depletion in the whitefish supply; it is the removal from the lakes of a larger number than can be replaced by natural processes and than has been successfully returned by artificial hatching. Greater results from the latter methods depend upon a better knowledge of exact conditions in the lakes, and to aid in this has been the object of our studies.

SOURCE OF FOOD SUPPLY.

The question as to the food of the whitefish and the amount of the supply at any point, or, expressed in other terms, the actual fish supporting power of any region is not determined by a single element. The number of *Mysis* and *Pontoporeia* in any given area does not determine the fitness of that region for raising whitefish.

Not only must the present supply of whitefish food be large, but the region must be capable of maintaining the supply constant in spite of the inroads made by the fish, else the food would soon be exhausted and the fish starved to death. The further test must be then made as to the capacity of the place to furnish these food animals with sufficient nourishment for rapid multiplication. Thus we are taken back step by step through the entire series of biological interdependence to the primitive food supply, which must always be plant life, since that alone has the power to manufacture living matter out of the simpler substances taken from earth, air and water. It is then clear that the entire series of biological relations must be worked out, and with each step will come new light on the subject.

The question of the source of the food of the lake fish brings us to consider first in brief the peculiar characters of these bodies of water in comparison especially with the inland lakes. On the more extended trips into Lake Michigan, which were undertaken with a view to obtaining evidence on the distribution of life in the lake, the contrast between this and an inland lake, or even Lake St. Clair, became very apparent. The most striking peculiarity was the entire absence, in the part of the lake examined, of the larger plants. The shore plants and rushes which in Lake St. Clair formed several distinct zones (Pieters, 94) along the margin of the lake, were either entirely absent or present in rare instances. The shallow part along shore, or lake terrace (Reighard, 94, p. 13) is very narrow at this point and subject to considerable change by the frequent storms; to this is due no doubt the absence of shore vegetation, and there are out in the lake, beyond the shore terrace, no areas shallow enough to permit the growth of such vegetation. Not only were the littoral zones bare of plants but the bottom also. The fields of *Chara* which carpeted the bottom of Lake St. Clair so densely that Reighard (p. 15) compares them to a thrifty field of clover, were almost never found. Only once in the sheltered High Island harbor was there a shallow area covered in this way with *Chara*. Elsewhere stretches of bare sand alternated with equally bare rocky bottoms or with areas of huge cobblestones. The stones brought up in the dredge were frequently covered with a film of a pale greenish tinge, which under the microscope appeared to be made up of myriads of minute unicellular algæ. Rarely one found a few threads of *Cladophora* or other filamentous alga, but aside from these insignificant exceptions *no fixed plants*. The rich variety of forms, worms, crustaceans, mollusks and insect larvæ, dredged from the *Chara* beds of Lake St. Clair, were entirely lacking. In their place the dredge yielded in many regions a considerable number of specimens, belonging, however, only to a few genera. The *Mysis* and *Pontoporeia*, though taken from near the bottom undoubtedly obtain their food mostly from the water and are not properly bottom feeding forms. The Lamellibranchs are dependent upon the same source of food supply; but the Gastropods and a few species of insect larvæ, almost entire Chironomids, are true bottom forms. They live either on the microscopic plants or on decaying matter which has fallen from the superjacent water. Wherever fixed plants were found there was no dearth of life. The *Chara* beds found at High Island harbor were as rich in life as those of Lake St. Clair. Mr. Walker mentions in his report (Appendix V), the extraordinary number of species of mollusks obtained there from a single haul of the trawl.

It should be mentioned here that the *Chara* beds do not in themselves afford nourishment directly to any fish, or so far as I can find to any abundant animal; and hence their absence does not directly reduce the food supply. Indirectly, it affects the conditions very materially; for the beds afford shelter to myriads of small bottom forms, crustaceans, insect larvæ, and worms, which find food in the microscopic plants growing among them. Hence they are breeding beds for fish food and furnish the best of conditions for the development of bottom feeding fish. Lake Michigan does not furnish in this region a sufficient variety of bottom food for many species of bottom fish. The few forms which are found are all included in the menu of the whitefish; they seem, however, so far as our observation went, to be widely distributed and to be present each in considerable numbers.

Some of the physical characteristics of the lake, though less striking at first, are equally important. That part of the lake which lies above the ten fathom line (18.3 meters) forms but a very narrow border on the map; yet this is more than three times the greatest depth observed in Lake St. Clair. The extreme depth reached in our work was 130 meters, which is just the average for the entire lake, and not quite two-thirds of the extreme depth. The considerable depth of most of the lakes involves very different conditions of life in the greater part of the waters from those which exist in a shallow lake. Perhaps the most important is temperature. On different days the surface temperature (1) of the lake varied from 16.7° to 19.4° C. (62° to 67° F.). The bottom temperature was always less than the top and in twenty to twenty-five meters was only 10° to 6.4° C. (50° to 43.5° F.) while at the deepest stations (112 and 130 m.) the thermometer registered only 4.2° C. (39.5° F.) on the bottom. In general it appears that near the surface the fall in temperature is more rapid for the same amount of descent than near the bottom; there were however, curious variations in bottom temperature at about the same depth, *e. g.* 14.4° C. at 22 meters, Station xxi, and 6.4° C. at 24 m,, Station ii, which show wide departure from the general principle of equal temperature at equal depths, owing perhaps to local conditions. Our observations are not extended enough to throw light upon special cases. The whole of the lake in this region below the limit of 25 m. from the surface has a temperature of 7.5° C. (45.5° F.), or less, which is about 11° C. (20° F.) lower than the surface temperature, while the water below 110 to 130 m. does not rise above 4° C. (39.2° F.), which is the temperature of maximum density for fresh water. Here temperature conditions are probably uniform the year through, while at the surface they are subject to the greatest fluctuations.

In the next place the amount of light decreases rapidly with the depth, and yet not so rapidly here as in ordinary lakes Since the amount of inflow is small in proportion to the total volume of the lake, and since the shallow area where the water can become roily in time of storm is very limited, the water contains extremely little inorganic matter in suspension, and hence the northern lakes are noted for their transparency. In the Charlevoix region the water is beautifully clear and allows objects to be discerned at considerable depths. We made no tests to determine the relative transparency of the water, but its evident superiority in this respect compensates for the great depth to a large extent by permitting the passage of a much larger amount of light, and hence the development of plant life in deeper strata of the water. Again, the disturbance in time of storm does not extend very far from the surface. The ten fathom line lies far below wave action and thus the greater portion of the water is undisturbed by storms.

Furthermore, the pressure increases with the depth. At about 10 m. the pressure is twice that at the surface (one atmosphere, 15 lb. sq. in.); at 103 m., all forms are subjected to a pressure of 11 atmospheres. Yet the animals brought up from this depth seemed to suffer no inconvenience by their rapid transit from a pressure of 165 lbs. to the square inch to one of only 15 lbs. to the square inch.

Finally, the lake is free from such currents as exist in Lake St. Clair. The slow movements of the water in definite directions are not at all comparable with the stream of a river, and the limited inflow and outflow, already discussed in this report, serve to maintain the lake in a condition of stable equilibrium.

The factors just discussed are of the greatest importance in determining the character of the food supply in the lake, as well as its distribution. But it should first be noted that the question of food supply here is totally

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[1] See table of plankton hauls on pages 32 to 35.

unlike similar questions in agriculture and the difference is fundamental in its character. The land animals which furnish the large part of man's food supply are herbivorous. Their supply of food is drawn from the great group of grasses, grains and forage plants, which growing before our eyes, derive nourishment from the inorganic materials in earth, air and water. There intervenes but a single step from the inorganic to the organic and the chain of biological relations is short and simple in the main. It is not only capable of immediate observation, but it has also been in all its details the subject of long continued and careful study in numerous experiment stations of the country. The preparation and the enrichment of the soil, the development of the seed, the growth of the plant, the diseases which threaten it, the enemies which attack or crowd it out, its protection and improvement have been for many years the care of trained minds on experimental fields and in well equipped laboratories. How different the case for the fish culturist! In many instances he does not even know the immediate food of the species in question. Observations on its habits and life history are all too scanty and experimentation limited and uncontrolled.

The series of biological relations are also widely different from those on the land. In fresh water there are few large plants; in the Great Lakes a still scantier amount. Among all the food fish there are none that depend on these plants for food supply; they are purely carnivorous. One of the most fundamental questions for the fish culturist is then clearly the source of food supply in the Great Lakes and the steps in the process of its transformation into fish flesh. Directly connected with this are the questions of its amount and distribution since fish culture is evidently depedent for success and development upon these factors. Unless the primitive food supply be abundant at the present time, all efforts to increase the number of fish will fail of ultimate success; unless the food of the fry is found in sufficient quantities in that locality where the fry are planted, the maximum number can never reach the adult condition; and finally the possible increase in the fish supply is limited by the amount and distribution of the food in so far as those factors are themselves beyond the control of the fish culturist.

The limited inflow of Lake Michigan renders the amount of food supplied to its waters from this source comparatively insignificant and, moreover, it is almost entirely inorganic matter which is received in this way. The limited shore areas and general lack of shore plants make the shore washings an equally unimportant source of food supply, although from it as from the preceding source would be received a certain amount of inorganic material in solution and in suspension. The occasional fields of *Chara* and other bottom algæ add only a limited amount of food, but the scanty development of this bottom flora, already commented upon, precludes the possibility of considering it more than a secondary source of food supply.

From the atmosphere is leached out by every rain much valuable inorganic matter, and the winds bring from time to time insects, both singly and in swarms, which fall a ready prey to the fish of the water. But even this is a secondary and incidental source; the biological relations of the life in the water are not seriously affected by this addition. No sufficient source of primitive organic food material can be found external to the lake; it must be sought *within the water itself.* It must also be capable of forming the inorganic material into living matter, and since we have already seen that of the green plants which possess this power, the larger fixed forms are lacking or present in entirely insufficient quantities, it is clear that the source whatever it may be must escape notice by virtue of the minute size of its individual elements, since the abundance of the material as a whole must necessarily be presupposed.

If one draws through the water a net of finest gauze and collects its gleanings into a small glass, there will be seen a myriad of minute forms almost or quite invisible to the eye. The mass of material obtained depends not only upon the length of the haul and size of the net, but upon numerous other conditions as well. Under no probable circumstances, however, will the net fail to collect a certain amount of material which the microscope shows to be composed of living organisms of varied character. Among these are both plants and animals, the latter so insignificant that their own motion does not suffice to carry them over any considerable distance, and hence both plants and animals are dependent upon waves, currents and winds for their wide distribution. Their entire existence is passed floating freely in the water and both plants and animals possess characters of form or structure fitting them for maintaining their position. Very many are provided with long processes, enabling them to present greater surface to the water; others have oil drops reducing their specific gravity. This mass of living forms is known as the *plankton*, and it plays such an important part in the economy of the water that the relations may briefly be outlined here. One may justly call it the *primitive food supply* of the water, and as such it is of course the origin of fish food.

The smallest forms in the plankton are the one-celled plants and animals, and the first are really the actual* source of the food supply. They float, as it were, in a sort of broth, or nutritive fluid, the water containing in solution those simple inorganic substances which they are enabled by the possession of green matter (chlorophyll or some related substance) and in the presence of light to transform into living protoplasm. The well known principle that rapidity of chemical action depends upon the proportion of surface to volume, was long ago used by Leuckart to explain the extraordinary growth of these unicellular plants.† In them the proportion of surface to volume is far greater than in any larger forms; the production of protoplasm, that is growth, goes on with extreme rapidity and the simple process of reproduction by division which characterizes them, results in the production of many generations within a limited period of time. These unicellular plants are the food not only of the unicellular animals, but also of some of the higher forms, and it is on their extraordinary power of multiplication that the entire economy of the water depends in last analysis.

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*There is a large group of doubtful forms, frequently classed as animals among the flagellate protozoans; they contain chlorophyll, or some allied substance, and by virtue of this are enabled to make use of inorganic food material like the green plants. These forms, which are abundantly represented in the plankton, are classed by other authorities as plants. If the latter classification be accepted, the statement made above is exactly true; if, however, these forms are regarded as animals, there must be a minor exception recorded against the statement that the simple plants are the *only* actual source of the food supply. This is a matter both undecided and secondary at most and needs no further explanation here; it is mentioned only to avoid danger of misunderstanding the statements made in the text. In any event the primitive source of food supply is found exclusively within the unicellular forms of the plankton.

†Zacharias (95, p. 108) calls attention to the growth of these algæ as more rapid than that of the higher plants, such as rye, and finds in this evidence that "the living organic substance of which the contents of the *Melonia* threads are made must be much more easily formed anew than that of the rye." This is evidently a false conclusion; the rapidity of growth is not due to any theoretical ease of formation of the substance in question, but is clearly traceable *to the greater proportion of surface to volume*, and hence greater possibility of chemical activity, and secondly to *the total immersion of the growing body in the nutritive fluid*. In the higher plants it is also true that a considerable amount of energy must be devoted to the differentiation of organs for supplying all parts equally with nourishment. In the simpler algæ, *Melonia* in the case cited above, all parts are alike active and growing.

In the plankton are contained, however, in addition to the unicellular plants and animals already mentioned, the Rotifera and many Crustacea. Other forms seemed to be either rare or entirely wanting in the plankton taken at Charlevoix, but a more exact enumeration of the species encountered in this region may be found in the introduction and in the appendices to this report. These four elements together constitute the food supply of the lake. The unicellular plants, or Protophyta, are dependent upon inorganic nourishment; the Protozoa subsist upon these plants and both form the food of the Rotifera, while the Crustacea feed upon anything which falls in their way. The last group forms the predominating element in the plankton, constituting in almost all instances the greater portion of any haul, and they are the immediate source of food for the lake fish. The fry depend directly upon the Crustacea of the plankton and rarely also the adult draws its nourishment from the same source, as in the case of the lake herring. More frequently it is through the medium of some larger form or forms. Thus the lake trout is piscivorous and feeds upon the herring and smaller forms. Of the whitefish food, already discussed and described, each species is dependent entirely upon the plankton, living or dead and sunk to the bottom, except the univalves, which also draw a portion of their nourishment from the fixed microscopic plants of the bottom. Reighard has given (p. 24) a table showing the interdependence of the various forms of life in a fresh water lake; it includes shore and bottom forms as well as the plankton.

It was apparent soon after the work of Charlevoix began that in general the plankton did not contain as many species as in Lake St. Clair, but the total mass per volume of water proved considerably greater. This was due to the greater number of individuals of a species present. Especially striking was this in the case of the small Crustacea, for often a bottom tow made in Round Lake was so thick as to deserve the name of "crustacean soup," and yet it consisted almost entirely of a single species of Copepod. The catch recalled hauls taken in the ocean in respect to total amount of material, but was far from possessing the rich variety of forms characteristic of marine tows. Not only did none of the hauls from Round Lake show the great number of species recorded in occasional tows on Lake St. Clair, but the average haul was decidedly inferior in this respect to the average haul from the latter place. In spite of this it was regularly true that the total amount of plankton in the average haul from Round Lake was considerably greater than the total amount obtained in average hauls from Lake St. Clair. The same feature became apparent during work in Pine Lake and Lake Michigan at a later date; the plankton in these lakes contains only a limited number of species present in a large number of individuals.

QUANTITATIVE PLANKTON WORK.

Since the plankton plays such a fundamental part in the life of the water, in being the primitive food supply, some guide to the fertility of the lake will be given by ascertaining as exactly as possible its amount and its distribution, both vertically into zones and horizontally into areas if such exist. The determination of fluctuations in amount and quality with weather and seasons is of equal importance; but our observations extended over too limited a period to permit of obtaining evidence on these points. The work of the summer throws some light on the questions of amount and distribution in the Charlevoix region, important not only in themselves, but for comparison with the data derived from similar experiments in Lake St. Clair during the previous year. Our experiments on these points were made in the course of the last two weeks of August, those of Reighard in Lake St. Clair during the second week of September. They are probably sufficiently identical in time that direct comparisons may be drawn between the figures without the danger that we are dealing with results which represent conditions of different seasons of the year. This precaution in treating the results is necessary since both Apstein and Zacharias have shown the existence in various European lakes at least of a considerable seasonable variation, both in the amount and in the quality of the plankton.

The apparatus used in these determinations was the modified vertical net described by Reighard (p. 26-29) and the process followed in the management of the net and the treatment of the material obtained was almost identical. Slight modifications introduced by the writer were successful enough to warrant mention in this place. The plankton holders made by cutting off the bottom of a short 6 dr. homeopathic vial and annealing the edges, as used in 1893, had some slight disadvantages. Apart from the waste of time and bottles in making a supply of perfect tubes, it was difficult to tie the gauze over the bottom so securely that it would not come off under some circumstances, and the mouth of the bottle was so small as to render it wearisome to change the fluids on account of the tardiness of the filtering in case the enclosed mass of plankton was at all large. In view of these two difficulties, I had Whitall, Tatum & Co. make some plankton tubes after my model. The tubes were pieces of ⅞ inch glass tubing 3 inches long, with a carefully constructed flange at each end which turned outwards about one-sixteenth inch. It was found that the flare increased the filtering surface sufficiently to aid greatly in the passage of fluids and that the gauze could be tied over the end with great security and rapidity. We had occasion to preserve 11 or 12 cc. in a single tube, but in spite of the mass had no difficulty at all in filtering the water out and in getting various fluids through the tube. The flange was also of material assistance in tying the second gauze to close the tube; this was frequently done when the boat was rocking violently and in no case did we lose any of the contents of the tube. In transferring from one fluid to another a syringe bulb with a fine glass tube pipette was used to force air into the tube through one gauze end and thus render more rapid the passage of the fluid through the other gauze from the tube. I feared at first that in spite of the No. 20 silk gauze used for covering the ends of the tubes there might be some small loss of plankton on account of the pressure which could be exerted by the bulb, or at least some damage done to delicate forms; but after experimenting we could detect no loss in the washings nor damage to the most delicate forms in the plankton and hence adopted this method in all our subsequent work. These two trivial modifications mean a saving in time for each tube of plankton put up of at least twenty per cent, and much more where the amount of plankton is exceptionally large.

Between the eleventh and twenty-ninth of August eight days were spent with the fishing tug "Minnie Warren" in making stations at various points in the Charlevoix region. In all twenty-six stations were made, two in Round Lake, six in Pine Lake, and eighteen in Lake Michigan. The stations, which are indicated in order by Roman numerals on the map of the region appended to this report, were made chiefly on fishing grounds of past or present value, and in the selection of these we had the assistance of Capt. John O'Neil of the "Minnie Warren," an old and successful fisherman of Charlevoix. In addition to the stations on fishing grounds some few were made in adjacent waters, either very shallow or very deep, in order to obtain material for the comparison of the various places. It is thought that these stations represent very fairly the different conditions which prevail in this region and afford then some idea of its character as a whole.

At each station the depth of the water and temperature of the water at bottom as well as at the surface and of the air were first taken with the sounding machine and thermometers lent by the United States Fish Commission. The condition of surface, of sky and weather were also noted and the exact position and character of the place recorded. A series of hauls with the vertical net was made at 2, 5, 10, 25, 50, 100 meters and bottom, the length of the series depending each time on the depth of the water. The contents of the net at each haul were preserved in a plankton tube of the character already described and provided with a label bearing the number of the station and haul. Further details of the process may be found in Professor Reighard's report (p. 27, 28). In this way a total of one hundred tubes of plankton were obtained.

In the table of plankton hauls (p. 32–4) it will be noticed that the depth of the water and the depth of the haul do not bear any constant relation to each other. This is due to the different methods employed in obtaining each. The depth of the water was recorded by the sounding machine, as already described, while the depth of the haul was measured on the rope of the vertical net which was marked off by meters so that the distance from the upper ring of the cone of the net to the surface of the water could be determined directly. In this way the distance through which the net was hauled could be measured without danger of error from the slight slant of the net rope or from inequalities of the bottom. This method of obtaining the depth of the haul was used for all stations after the first three (I to III^3 inclusive).

After the vertical hauls were finished, the anchor was lifted and two or more of the dredges as well as bottom and top tow nets were used to ascertain the character of the bottom and the quality of the life in the water at this place. The tows were examined by various members of the party after the return to the laboratory and the results of the examination entered on the regular blanks. This gave an approximate idea of the composition of the plankton from any station, as well as of the bottom fauna and flora. Various circumstances interfered with carrying out this plan in full at all stations. However dredgings were made in the majority of cases, including one at station xi from a depth of 112 m., but at the deepest station, 130 m., the dredge was not used.

For the determination of the quantity I used the tubes of plankton collected at the various stations and preserved as described above. The contents of each were carefully transferred to a glass cylinder or measuring tube graduated to tenths of a cubic centimeter and were allowed to settle exactly twenty-four hours. The volume was then taken and recorded. This volume is only an approximation of the amount of the plankton since the latter is very light and will settle for days if left undisturbed. It will naturally settle more quickly if shaken occasionally, and the degree of concentration it reaches depends very clearly on the character of the material in this particular plankton haul. Finally the mass

Conditions of—																		Volume of plankton in cubic centimeters.		
Time, 1894.			Haul.						Water.					Air.					Calculated, using mean velocity 0.61 m. per second.	
										Temperature in degrees Centigrade.										
Month.	Day.	Hour.	Serial number.	Place.	Character.	Depth from which drawn.	Velocity in meters per second.	Bottom.	Depth in meters.	Bottom.	Top.	Surface.	Current.	Temperature in degrees Centigrade.	Wind—direction and strength.	Sky.		Taken in vertical net.	Under 1 sq. meter of surface.	Per cubic meter of water.
Aug.	11	10:30 A. M.	I	Lake Michigan	B	107.8	.60		108.22	5.1	18.9	Slightly rough			S W, 3	Hazy		9.74	176.29	1.64
"	11	12:30 P. M.	II		B	24.1	.58		24.52	6.4	18.3	"			S W, 3	"		5.08	91.95	3.82
"	11	12:50 "	IIq		B	24.1	.42		24.52	6.4	18.3	Nearly smooth			S W, 2	Light rain		4.20	76.02	3.3
"	11	3:45 "	III		B	50.5	.61		50.92	5.6	16.7	"			S, 1	Hazy		7.53	136.11	2.70
"	11	4:00 "	III^2		S	10	.77		50.92	5.6	16.7	"			S, 1	"		3.15	57.08	5.70
"	11	4:10 "	III^3		S	3	.75		50.92	5.6	16.7	"			S, 1	"		2.50	45.35	15.08
"	11	5:05 "	IV		B	35	.32		36.78	5.8	17.8	"			S, 1	"		9.50	171.95	4.91
"	15	10:30 A. M.	V	Pine Lake	B	22	.63		20.74	13.1	18.9	Light waves		14.8	N, 3	Cloudy		3.50	68.35	2.88
"	15	10:40 "	V^2		S	15	.71		20.74	13.1	18.9	"		14.8	N, 3	"		3.26	59.01	3.98
"	15	10:50 "	V^3		S	10	.50		20.74	13.1	18.9	"		14.8	N, 3	"		2.44	44.16	4.43
"	15	11:00 "	V^4		S	5	.50		20.74	13.1	18.9	"		14.8	N, 3	"		1.61	29.14	5.78
"	15	11:30 "	V^5		S	2	.40		20.74	13.1	18.9	"		14.8	N, 3	"		1.32	23.89	11.95
"	15	12:00 M.	VI		B	30	.56		33.01	10.4	20	Little smoother		14.4	N, 3	"		3.78	68.42	2.28
"	15	12:15 P. M.	VI^2		S	15	.60		33.01	10.4	20	"		14.4	N, 3	"		3.35	60.64	4.04
"	15	12:30 "	VI^3		S	5	.50		33.01	10.4	20	"		14.4	N. 3	"		2.35	42.54	8.51
"	15	12:45 "	VI^4		S	2	.50		33.01	10.4	20	"		14.4	N, 3	"		1.27	22.99	11.5
"	15	2:00 "	VII		B	30	.59	Yellow marl	33.01	10.6	18.6	Few white caps			N N W, 3	Clearing		5.20	94.12	3.14
"	15	2:20 "	VII^2		S	15	.63	"	33.01	10.6	18.6	" "			N N W, 3	"		3.79	68.6	4.51
"	15	2:35 "	VII^3		S	10	.71	"	33.01	10.6	18.6	" "			N N W, 3	"		3.13	56.65	5.67
"	15	2:45 "	VII^4		S	5	.56	"	33.01	10.6	18.6	" "			N N W, 3	"		3.00	54.3	10.86
"	15	3:00 "	VII^5		S	2	.50	"	33.01	10.6	18.6	" "			N N W, 3	"		1.68	30.41	15.20
"	15	3:15 "	VIII		B	11	.58	Marl	11.32	20	21.1	White caps		18.1	N N W, 4	Clear		3.55	64.26	5.84
"	15	4:00 "	VIIIq		B	11	.60	"	11.32	20	21.1	"		18.1	N N W, 4	"		3.20	57.92	5.27
"	16	9:20 A. M.	IX	Lake Michigan	S	2	.67	Sand	28.29	10	18.3	Slight swell		18.3	N W, 2	"		1.07	19.37	9.68
"	16	9:30 "	IX^2		S	5	.63	"	28.29	10	18.3	"		18.3	N W, 2	"		2.25	40.73	8.15
"	16	9:40 "	IX^3		S	10	.59	"	28.29	10	18.3	"		18.3	N W, 2	"		3.02	54.66	5.47
"	16	9:55 "	IX^4		S	25	.51	"	28.29	10	18.3	"		18.3	N W, 2	"		6.48	117.29	4.60
"	16	10:15 "	IX^5		B	26	.52	"	28.29	10	18.3	"		18.3	N W, 2	"		6.41	116.04	4.46
"	16	11:30 "	X		S	2	.57	"	55.93	5.2	18.3	Smoother		15.6	N W, 1	"		1.02	18.46	9.23
"	16	11:40 "	X^2		S	5	.56	"	55.93	5.2	18.3	"		15.6	N W, 1	"		1.45	26.35	5.35
"	16	11:50 "	X^3		S	10	.50	"	55.93	5.2	18.3	"		15.6	N W, 1	"		2.64	47.78	4.78

"	16	12:05 P. M.	X^{4}	Lake Michigan	S	25	.54	"	55.93	5.2	18.3	"	--	15.6	N W,	1	"	5.35	96.84	3.87
"	16	12:20 "	X^{5}		B	53	.59	"	55.93	5.2	18.3	"	--	15.6	N W,	1	"	5.90	106.79	2.01
"	16	1:50 "	XI		S	2	.57	Sand & debris	112	4.2	18.3	Rippled only	--	16.7	S,	1	"	1.22	22.08	11.04
"	16	1:58 "	XI^{2}		S	5	.71	" "	112	4.2	18.3	" "	--	16.7	S,	1	"	1.95	35.30	7.06
"	16	2:05 "	XI^{3}		S	10	.89	" "	112	4.2	18.3	" "	--	16.7	S,	1	"	3.68	66.61	6.66
"	16	2:35 "	XI^{4}		S	25	.69	" "	112	4.2	18.3	" "	--	16.7	S,	1	"	6.38	115.48	4.63
"	16	2:45 "	XI^{5}		S	50	.75	" "	112	4.2	18.3	" "	--	16.7	S,	1	"	8.72	157.88	3.16
"	16	3:00 "	XI^{6}		B	112	.75	" "	112	4.2	18.3	" "	--	16.7	S,	1	"	9.41	170.32	1.52
"	16	4:05 "	XII		S	2	.57	Sand	5.66	18.3	18.3	" "	--	16.7	S,	1	"	1.48	26.79	13.39
"	16	4:15 "	XII^{2}		B	4.3	.67	"	5.66	18.3	18.3	" "	--	16.7	S,	1	"	1.35	24.44	5.68
"	16	5:10 "	XIII		S	2	.57	"	32.06	7.5	18.3	" "	--	16.7	S W,	1	"	1.57	28.42	14.21
"	16	5:20 "	XIII^{2}		S	5	.83	"	32.06	7.5	18.3	" "	--	16.7	S W,	1	"	2.30	41.68	8.33
"	16	5:30 "	XIII^{3}		S	10	.63	"	32.06	7.5	18.3	" "	--	16.7	S W,	1	"	4.40	79.64	7.96
"	16	5:40 "	XIII^{4}		S	25	.78	"	32.06	7.5	18.3	" "	--	16.7	S W,	1	"	9.35	169.24	6.77
"	16	5:55 "	XIII^{5}		B	30	.75	"	32.06	7.5	18.3	" "	--	16.7	S W,	1	"	7.91	143.17	4.77
"	17	12:00 M.	XIV		B	8	.47	"				Rough	--		Terrific squall		Low clouds	3.61	65.34	8.16
"	18	9:00 A. M.	XV		S	2	.40	Mud & Chara	11.32	16.7	17.2	White caps	--	18.9	N E,	4	Cloudy	1.4	25.34	12.67
"	18	9:10 "	XV^{2}		S	5	.59	" "	11.32	16.7	17.2	"	--	18.9	N E,	4	"	1.72	31.13	6.23
"	18	9:20 "	XV^{3}		B	10	.63	" "	11.32	16.7	17.2	"	--	18.9	N E,	4	"	2.95	53.40	5.34
"	18	12:15 P. M.	XVI		S	2	.57	Sandy mud	22.68	7.2	17.5	Few white caps	--	16.7	N,	3	Clearing	1.50	27.15	13.58
"	18	12:25 "	XVI^{2}		S	5	.67	"	22.68	7.2	17.5	" "	--	16.7	N,	3	"	2.34	42.35	8.47
"	18	12:35 "	XVI^{3}		S	10	.77	"	22.68	7.2	17.5	" "	--	16.7	N,	3	"	4.47	80.91	8.09
"	18	12:45 "	XVI^{4}		B	23.5	.57	"	22.68	7.2	17.5	" "	--	16.7	N,	3	"	6.98	126.34	5.38
"	18	4:30 "	XVII		S	2	.50		132.66	4.2	18.3	White caps rare	--	18.9	N b E,	3	Scattered cl'ds	1.29	23.35	11.67
"	18	4:35 "	XVII^{2}		S	5	.59		132.66	4.2	18.3	" "	--	18.9	N b E,	3	" "	2.45	44.35	8.87
"	18	4:42 "	XVII^{3}		S	10	.61		132.66	4.2	18.3	" "	--	18.9	N b E,	3	" "	4.90	88.69	8.87
"	18	4:50 "	XVII^{4}		S	25	.57		132.66	4.2	18.3	" "	--	18.9	N b E,	3	" "	8.80	159.28	6.37
"	18	5:00 "	XVII^{5}		S	50	.56		132.66	4.2	18.3	" "	--	18.9	N b E.	3	" "	9.90	179.19	3.58
"	18	5:20 "	XVII^{6}		S	100	.54		132.66	4.2	18.3	" "	--	18.9	N b E,	3	" "	9.28	167.97	1.68
"	18	5:50 "	XVII^{7}		B	130	.53		132.66	4.2	18.3	" "	--	18.9	N b E,	3	" "	8.86	160.37	1.23
"	22	3:30 "	XVIII		S	2	.57	Sand	36.78	6.4	19.4	Slight swell	--	21.7	W S W,	1		1.45	26.25	13.12
"	22	3:40 "	XVIII^{2}		S	5	.63	"	36.78	6.4	19.4	"	--	21.7	W S W,	1		1.86	33.67	6.73
"	22	3:50 "	XVIII^{3}		S	10	.65	"	36.78	6.4	19.4	"	--	21.7	W S W,	1		2.72	49.23	4.92
"	22	4:00 "	XVIII^{4}		S	25	.58	"	36.78	6.4	19.4	"	--	21.7	W S W,	1		4.98	90.14	3.61
"	22	4:10 "	XVIII^{5}		B	36	.57	"	36.78	6.4	19.4	"	--	21.7	W S W,	1		4.95	89.60	2.49
"	25	11:05 A. M.	XIX		S	2	.44	Sandy, shells	35.83	7.5	18.9	Few white caps	*	21.9	N,	3		1.42	25.70	12.85
"	25	11:15 "	XIX^{2}		S	5	.56	" "	35.83	7.5	18.9	" "	*	21.9	N,	3		1.93	34.98	6.99
"	25	11:28 "	XIX^{3}		S	10	.54	" "	35.83	7.5	18.9	" "	*	21.9	N,	3		3.25	58.83	5.88
"	25	11:35 "	XIX^{4}		S	25	.64	" "	35.83	7.5	18.9	" "	*	21.9	N,	3		6.55	118.56	4.74
"	25	11:45 "	XIX^{5}		B	36	.58	" "	35.83	7.5	18.9	" "	*	21.9	N,	3		11.90	215.39	*5.98
"	25	1:10 P. M.	XX		S	2	.44	Smooth sand	39.6	7.5	19.4	Rippled	--		S W,	1		1.02	18.46	9.23
"	25	1:15 "	XX^{2}		S	5	.59	" "	39.6	7.5	19.4	"	--		S W,	1		1.75	31.68	6.34
"	25	1:25 "	XX^{3}		S	10	.65	" "	39.6	7.5	19.4	"	--		S W,	1		2.74	49.59	4.96
"	25	1:35 "	XX^{4}		S	25	.64	" "	39.6	7.5	19.4	"	--		S W,	1		4.58	82.9	3.32
"	25	1:45 "	XX^{5}		B	41	.59	" "	39.6	7.5	19.4	"	--		S W,	1		6.08	110.05	2.68

* For discussion of this haul see pages 38 and 45. The figures are given in the table without correction.

Conditions of—																	Volume of plankton in cubic centimeters.		
Time, 1894.			Haul.					Bottom.	Water.					Air.			Taken in vertical net.	Calculated, using mean velocity 0.61 m. per second.	
									Depth in meters.	Temperature in degrees Centigrade.		Surface.	Current.	Temperature in degrees Centigrade.	Wind—direction and strength.	Sky.			
Month.	Day.	Hour.	Serial number.	Place.	Character.	Depth from which drawn.	Velocity in meters per second.			Bottom.	Top.							Under 1 sq. meter of surface.	Per cubic meter of water.
Aug.	25	2:00 P. M.	XXI	Lake Michigan	S	2	.44	....	22.63	14.4	19.4	Rippled	--	24.2	N, 2......	....	1.28	23.17	11.58
"	25	2:08 "	XXI2		S	5	.59	....	22.63	14.4	19.4	"	--	24.2	N, 2......	....	1.94	35.11	7.08
"	25	2:15 "	XXI3		S	10	.63	....	22.63	14.4	19.4	"	--	24.2	N, 2......	....	2.78	50.32	5.08
"	25	2:22 "	XXI4		B	22	.79	....	22.63	14.4	19.4	"	--	24.2	N, 2......	....	4.90	88.69	4.03
"	25	3:20 "	XXII		S	2	.57	Mud	43.88	7.2	19.4	Rough	--	20	N, 2......	....	.98	17.74	8.87
"	25	3:25 "	XXII2		S	5	.56	"	43.88	7.2	19.4	"	--	20	N, 2......	....	1.38	24.98	5.00
"	25	3:38 "	XXII3		S	10	.65	"	43.88	7.2	19.4	"	--	20	N, 2......	....	2.73	49.41	4.94
"	25	3:40 "	XXII4		S	25	.60	"	43.88	7.2	19.4	"	--	20	N, 2......	....	4.19	75.84	3.03
"	25	3:50 "	XXII5		B	42	.71	"	43.88	7.2	19.4	"	--	20	N, 2......	....	5.60	101.36	2.41
"	29	3:00 "	XXIII	Round Lake	S	2	.57	Marl	18.86	18.1	18.3	Light swell......	--	16.1	N, 5......	Cloudy	1.62	29.32	14.66
"	29	3:05 "	XXIII2		S	5	.67	"	18.86	18.1	18.3	"	--	16.1	N, 5......	"	1.85	33.49	6.7
"	29	3:10 "	XXIII3		S	10	.54	"	18.86	18.1	18.3	"	--	16.1	N, 5......	"	2.51	45.43	4.54
"	29	3:15 "	XXIII4		B	17.5	.67	"	18.86	18.1	18.3	"	--	16.1	N, 5......	"	3.83	69.32	3.96
"	29	3:30 "	XXIV		S	2	.67	"	6.6	18.3	18.3	Rippled	--	16.1	N, 5......	"	1.60	28.96	14.48
"	29	3:35 "	XXIV2		B	4	.57	"	6.6	18.3	18.3	"	--	16.1	N, 5......	"	1.52	27.51	6.88
"	29	4:15 "	XXV	Pine Lake.	S	2	.67	Blue marl	15.09	18.1	16.1	Rough	--	16.7	N, 5......	Clearing......	1.20	21.72	10.86
"	29	4:20 "	XXV2		S	5	.83	" "	15.09	18.1	16.1	"	--	16.7	N, 5......	"	1.88	34.05	6.81
"	29	4:25 "	XXV3		S	10	.87	" "	15.09	18.1	16.1	"	--	16.7	N, 5......	"	3.10	56.11	5.61
"	29	4:30 "	XXV4		B	15	.83	" "	15.09	18.1	16.1	"	--	16.7	N, 5......	"	2.63	47.60	3.17
"	29	4:45 "	XXVI		S	2	.67	Marl	21.69	11.1	16.1	Little rough....	--	18.3	N, 4......	"	1.41	25.52	12.76
"	29	4:50 "	XXVI2		S	5	.71	"	21.69	11.1	16.1	"	--	18.3	N, 4......	"	1.49	26.97	5.39
"	29	5:00 "	XXVI3		S	10	.77	"	21.69	11.1	16.1	"	--	18.3	N, 4......	"	2.6	47.06	4.71
"	29	5:10 "	XXVI4		B	21	.62	"	21.69	11.1	16.1	"	--	18.3	N, 4......	"	2.71	49.05	2.34

obtained depends to some extent upon the diameter of the measuring tube in which the settling is done, as I ascertained in the course of some experiments on this matter. These experiments are discussed in full in another paper, and it is sufficient to note here that the volumes entered in the table were measured in the same tubes and as exactly as possible under the same conditions as those recorded by Reighard for Lake St. Clair. The results, then, are directly comparable with those he gives (p. 29, 30), and are also an approximate measure of the amount of plankton in these waters. The volumes obtained are entered in the table of plankton hauls given here (pp. 32–4.)

These volumes are relative to the size of the net; and as was first shown by Hensen (87) and as is explained also by Reighard (p. 28), for general use it is necessary to apply a total correction in order to find the amount of plankton under one square meter of surface. In this way are eliminated the special features due to the size of the individual net employed and the filtering power of the material used in its construction. In the first place, the net opening has not an area of one square meter and in the second place the resistance of the stuff forces some water aside, so that the net does not filter the entire column of water through which it passes. The area of the net opening is 1,237.86 sq. cm., so the correction for the area is 8.08. Hensen has given a table of corrections for varying velocities also, and these were used by Reighard, though the uncertainty of the method by which they were calculated was discussed in an appendix (p. 57) to his report. In some cases Reighard was forced to adopt a correction for an average velocity since that for the observed velocity was such as to make the result an absurdity. Similar cases occurred in my own calculations as for instance at station IV, where the amount of plankton per cubic meter of water was more for the entire depth than any station furnished in the surface statum, and as will be shown later, this stratum contains always more than any other of similar thickness. I, therefore, calculated the amounts on the basis both of the observed velocity and of the average velocity, and plotted the results in a manner to be explained later. It was at once evident on the examination of the plot that the lines were practically coincident except in a few cases, and in half of these the results based upon observed velocity were evidently false. I therefore decided to use a correction of 18.10 based upon an average velocity of 0.61 m. per second and a net opening of $\frac{1}{8.08}$ sq. m. And the amounts under each square meter of surface as given in the table are obtained by multiplying the volume of plankton taken by this average correction of 18.10. The results in the corresponding column of Reighard's table were obtained by using the actual correction according to Hensen's method save in the few instances noted. My adoption of an average correction was influenced not only by the facts above but also by some other considerations. In the first place a physicist, who at my request made a very careful examination of Hensen's method of approximations, gave it as his opinion that the physical principles involved would not hold good for velocities at either extreme, if indeed they were correct for mean velocities. In the next place, it is difficult to observe the *exact* time of a haul and the error in observation, which is of course increased by movements of the boat or by irregularities of the surface of the water, is proportionally very much greater for the shallower strata. Finally in comparing results of Reighard, and myself, it will be possible to see whether the the deductions made hold good under both circumstances, that is are really general principles, or whether they are modified in any way by the method of calculation employed.

The volume per cubic meter of water as given in the table is obtained by dividing the volume under one square meter of surface by the depth of haul. Other details of the table are self explanatory. The hauls at stations I to IV inclusive were made on the first day and were somewhat experimental; they differ from the others in method of handling and preserving, and have not the same series of strata in depth; they are hence discarded in the study of strata. The hauls at XIV* were interrupted by a terrific squall and hence this is also omitted in the same connection.

A brief consideration of the question will show that the errors in the method employed are all in one direction and tend constantly to reduce the real amount, to make the final result less than the quantity actually present in the water. Although carefully guarded against, the loss of minute quantities by accident or in the course of the numerous manipulations undoubtedly does take place. Pauses however slight, or unequal velocities in movement during the raising of the net, failure of the gauze to filter as rapidly as usual owing to clogging or to some other cause, reduce the amount of water filtered by the net and hence also the amount of plankton obtained below that actually present in the column. Finally some forms, good swimmers, will escape the net as it is hauled up; this error is evidently less with our net, having an opening of 1,238 sq. cm. in area than with the nets used in European lakes by Zacharias and Apstein in which the area of the opening did not exceed 64 to 100 sq. cm.

This method does not, then, give absolute exactitude, nor can I see why that would be more desirable if possible. The variations in the amount of plankton present are greater far than the errors of the method, as already illustrated, and the approximation obtained by this method is sufficiently near for practical purposes. Certainly it is true that, since all errors tend only to reduce the actual amount, *the volume of plankton present is not less than the figures given in the table.* A single exception must be made in those cases when foreign matter is accidentally included in the net but these are easily detected by microscopic examination of the mass.

From Lake Michigan in the Charlevoix region eighteen bottom hauls show the following results in total amount of plankton obtained:

Number of Station	I.	II.	III.	IV.	IX.	X.	XI.	XII.	XIII.	XIV.	XV.	XVI.	XVII.	XVIII.	XX.	XXI.	XXII.	Av.
Volume of Plankton in cubic centimeters per cubic meter of water	1.64	3.82 3.20	2.70	4.91	4.46	2.01	1.52	5.68	4.77	8.16	5.34	5.38	1.23	2.49	2.68	4.08	2.41	3.69

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* Stations will be denoted hereafter by a Roman numeral only.

In Round and Pine lakes, which have immediate and free connection with Lake Michigan at Charlevoix, the amounts obtained in nine bottom hauls were as follows:

Number of Station	V.	VI.	VII.	VIII.	XXIII.	XXIV.	XXV.	XXVI.	Av.
Volume of Plankton in cubic centimeters per cubic meter of water	2.88	2.28	3.14	5.84 5.27	3.96	6.88	3.17	2.34	3.97

Twenty-seven bottom hauls were made in Lake St. Clair in 1893, two at each station except the first, with the following results (Reighard 94, p. 31):

Number of Station	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XIII.	XIV.	XV.	XVI.	Av.
Volume of Plankton in cubic centimeters per cubic meter of water	4.97 ----	1.44 2.68	2.76 3.89	2.01 2.01	2.74 3.62	2.29 3.08	3.69 3.69	2.70 3.01	2.54 2.39	4.15 4.15	4.79 3.97	3.60 3.31	1.80 2.42	1.90 2.33	3.03 ----

The total average for all Lake Michigan stations is 3.69 cc. of plankton per cubic meter of water. In Lake St. Clair the total average was 3.03 cc. per cubic meter of water. But the stations in Lake St. Clair varied in depth from 1.5 to 5.6 meters, while Lake Michigan hauls extended from 4 to 130 m., so that the comparison should be made with corresponding hauls of the latter only, and these have an average of 6.39 cc. or more than double the amount of the St. Clair hauls. The tabulation of results (Pl. I and III) afford a graphic presentation of these relations. *Lake St. Clair contains only half as much plankton per cubic meter of water as is taken from water of equal depth in Lake Michigan at Charlevoix.*

Reighard records (p. 37) the average of four bottom hauls made in Lake Erie in 1893, as 8.98 cc. per cubic meter of water. If compared with the hauls of corresponding depth in Lake Michigan they are evidently richer, and that by forty per cent. Reighard notes, however, the peculiar location and richness of the two stations at which the four hauls were made and mentions a third station with a different location and a much smaller volume of plankton. Including this haul also, the average of all the Lake Erie stations is 7.41 cc. of plankton per cubic meter of water, which is nearly one-sixth more than the average of stations of equal depth on Lake Michigan at Charlevoix. The number of observations is too small to permit of a positive statement, but it seems probable that there is somewhat more plankton per cubic meter of water in the western end of Lake Erie than in water of equal depth in Lake Michigan near Charlevoix.

In comparison with the volumes for European lakes, given by Apstein (94), Lake Michigan in the Charlevoix region is decidedly "plankton poor." Thus, in September, Great Plöner See, which is a typical "plankton poor" lake, contains, for a depth of 40 meters, 5 cc. of plankton per cubic meter of water. In Lake Michigan, two hauls of almost the same depth, XX and XXII, averaged only 2.55 cc. of plankton per cubic meter of water, or about one-half as much. And yet this small amount which is present constitutes *in toto* a tremendous mass. The estimated volume of Lake Michigan is about 7,500,000 millions of cubic meters, and if the average of the lake contains an amount of plankton per cubic meter of water equal only to the lowest amount for any bottom haul of the Charlevoix region (1.23 cc. at XVII^7), the total mass of plankton in the entire lake would equal *more than nine and one-third millions of cubic meters.* This deepest haul, XVII^7, was made at about the average depth of the lake and hence may well be taken as a representative haul for the lake, especially since, as the chart shows (Pl. I), this haul does not depart appreciably from the normal line of relative volumes—to be discussed later.

It is valuable to consider for a moment what actual amount of food is contained in this volume of plankton. For this purpose two masses of plankton, XIII^4 and XIX^4 were selected as average hauls, and XIX^5 as an instance of a haul which was evidently much polluted by foreign matter. The plankton was shaken up in a limited quantity of alcohol and a certain portion of the mixture removed, weighed, air-dried and weighed again. The weight of the same sample was also taken when dried to a constant weight at 100° C. and after calcining the ash was weighed. The ash was then digested in concentrated hydrochloric acid, washed, dried and weighed to obtain the approximate amount of sand present.* The plankton which remained after the removal of the small portion treated in the manner just described, was measured by the volumetric method and from this the exact portion removed was calculated from the original volume of the plankton. These results are expressed in the following table:

Number of haul.	Depth in meters of—		Volume in cc.		Percentage of original volume used.	Weight in milligrams.			
	Haul.	Water.	Original volume of haul.	Volume measured after removal of part.		Air dried sample.	Sample dried to constant weight at 100° C.	Ash in sample.	Silicious matter in sample.
XIII^4	25	32	9.35	4.88	47.8	58	50	7.6	2.3
XIX^4	25	36	6.55	1.00	84.7	61	57	8.	2.1
XIX^5	36	33	11.90	9.61	19.2	207	206	160.	112.

From these data may be obtained by simple calculation the following table in which figures are given to the nearest whole number:

Number of haul.	Percentage in air dried sample of—				Weight in milligrams for entire haul of—			Weight in grams of plankton under 1 sq. m. of surface.	
	Organic.	Entire ash.	Ash, not sand.	Sand.	Air dried.	Ash.	Sand.	Air dried.	Ash.
XIII^4	85.7	14.3	10.7	3.6	111	16	4.8	2.0091	0.2896
XIX^4	86.8	13.2	9.8	3.4	72	9	2.5	1.3082	0.1629
XIX^5	22.6	77.4	23.2	54.2	1077	833	583	19.5118	15.0773

A microscopical examination of XIII^4 and XIX^4 shows that they are very nearly pure plankton. We may then from the average of these two estimate that such plankton contains about 3.5 per cent of silicious material, 10 per cent of other earthy substances, largely calcareous, and 86 per cent of organic substance. The first element is entirely useless as food and the second somewhat so, but the third consists almost wholly of nutritive matter. From this somewhat rough calculation it may be seen that the plankton contains almost wholly matter useful as food and that the percentage of useless matter is very small.

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* These processes were very kindly carried out for me in the chemical laboratory of the University of Nebraska, by Mr. E. E. Nicholson, to whom my sincere thanks are due.

Comparing these figures with those from XIX^{5} it appears that there is in the latter haul an excess of 50 per cent in sand and 64 per cent in total inorganic matter. This represents foreign matter included in that haul and yet not all since there was also organic matter stirred up from the bottom in the haul and 75 per cent is a low estimate of the total foreign substance; this would make the actual volume about 7.5 cc. A more detailed description of the process and of its value in plankton studies may be found in another paper (Ward, 96^{a}).

Hensen (87, p. 34) has made some determinations of the percentage of the various elements in oceanic plankton, with the following results for fresh plankton hauls, which were drained nearly dry and then subjected to quantitative analysis. These hauls were composed largely of diatoms and contained also a certain unknown amount of sea water:

Organic matter	42.1	25.5	39.6
Soluble salts	7.3	43.8	17.3
Insoluble salts	50.6	30.7	43.1

The large percentage of soluble salts is undoubtedly due, in part at least, to the salt of the sea water, but even after the elimination of that factor, it will be seen that the lake plankton is very much richer in organic material, that is, in actual food matter. Some analyses of single species given by Hensen approach more nearly to the results obtained for the lake plankton. Thus *Mysis*, analyzed after drying, contained 89.6% of organic and 10.4% of inorganic matter; for *Salpa* the percentages were 85.4 and 14.6. and for other species similar results were obtained. From this it appears that the lake plankton is much more nearly pure food material than the marine plankton, having not far from the same proportion of organic matter that is contained in the more favorable forms from the ocean.

The total amount of plankton in the lake may also be estimated from the average volume of the two normal hauls XIII^{4} and XIX^{4}. Both hauls are from a depth of 25 m. and as will be shown this distance includes the great bulk of the plankton. The small amount below this limit will more than balance the deficiency in such limited areas as are less than 25 meters in depth. Under 1 sq. m. of surface at a depth of 25 m. these hauls show 1.5 to 2 g. of plankton, which amounts to 15 to 20 kg. to the hectare. The total area of Lake Michigan is about six million hectares or six hundred square myriamèters. A weight of plankton equal to 15 to 20 kg. to the hectare becomes 150,000 to 200,000 kg., or 150 to 200 metric tons to the square myriameter, or for the entire lake a mass of six hundred times that quantity, making the total weight of plankton in Lake Michigan not less than 90,000 to 120,000 metric tons.[*] Unless there is a much larger amount of plankton in the Charlevoix region than in other parts of the lake, a condition not at all likely, this estimate is conservative and falls below the true amount, since in it was discarded all the plankton lying below the 25 meter line. It is true that below this limit there may not be a large quantity to the cubic meter, yet the enormous area of the lake and the considerable depth below that limit would make even a small factor important on the whole. The table on page 50 shows that nearly half of this is contained in the surface stratum of two meters in thickness; or, expressed in terms of the actual amount, the surface two meters of Lake Michigan contains from 40,000 to 60,000 metric tons of plankton.

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[*] A metric ton is almost exactly equal to the English "long ton."

This calculation may be verified by a second computation, made on a different basis. As shown above, Lake Michigan is estimated to contain about 9,300,000 cubic meters of plankton. From the table given on page 38, it appears that 1 cc. of plankton weighs about .011 to .012 g., or 1 cubic meter would weigh 11 to 12 kg. The total mass of plankton in the lake, 9,300,000 cu. m., would on this basis weigh from 102,300,000 to 118,600,000 kg. or 102,300 to 118,600 metric tons. The close agreement in the results reached by this and the preceding method is evidence of the correctness of the approximation.

From these data it is easy to estimate the amount of plankton found under each acre of surface. Thus, 15 to 20 kg. to the hectare would equal 12 to 16 lb. per acre of surface. In comparing this with the production of the land it is necessary to consider the very high proportion of organic matter present here. Hensen (87, p. 96) has made a similar calculation for the ocean on the basis of the sum total of increment in the plankton from haul to haul; thus in a dozen periods having a total length of 228 days, the sum of all the increments in the plankton was 4,162 ccm.; an average of 18 ccm. per day, which in the course of the year would equal 6,570 ccm., and on the basis of analysis would contain 15-17 g. of organic material. The destruction of food matter by the Copepoda he had previously calculated at 133 g. yearly; hence the total yearly production must be at least 150 g. per square meter of surface. The estimated production of a similar area in grain would be 180 g. of dry organic matter, so that the water is little if any inferior and the consideration of other factors may easily show its productivity to be greater than that of the land.

More recently Zacharias (95, p. 107) has essayed a similar estimate on the basis of a single element, the increase in the amount of *Melosira* which reached within 29 days the sum of 1,500 kg. per hectare, or 1,200 lb. per acre.

From comparison of these figures with those of the fertility of the land, as measured by various crops, these authors are inclined to believe the productivity of the water equal to that of the land, or even slightly greater than it. There are, however, certain sources of error, especially in the latter comparison, which materially influence the result. In the first place the comparison is made by both authors with land in a high state of cultivation, whereas, the water is as yet untouched by like processes of stimulation. But more than this, the land which is taken as the basis for comparison, is protected from inroads and the entire product of its fertility stored up for future use. In the case of the water, the plankton is subject to daily and hourly diminution, one form devouring another until the material is finally carried beyond the reach of all calculations. The periodic increase in the volume of the plankton takes place in spite of the constant drain on its mass; and even were there no increase at any time, it is clearly evident that there must be active growth to keep the volume constant. To measure this growth, or to arrive at an approximate idea of the fertility of the water is, I think, beyond the limit of present possibilities. More data with reference to the continuous consumption of the plankton than those afforded by a single group must be obtained before we can estimate its ratio of growth. But least of all can the productivity of the water be measured by the abnormal increase of a single factor in the plankton. One thing is certain the productivity of the water is great enough to keep the food supply intact against all inroads made thus far. When the first European settlers reached this region they found the waters of the lakes teeming with fish. At least an equal number could thrive now in these waters.

DISTRIBUTION OF THE PLANKTON.

The distribution of the mass of food material is of the greatest moment for the fish culturist and the existence of variations in the quantity deserves careful investigation. There are in fact several problems here. The plankton may be equally or unequally distributed at various times of the year; independent of such seasonal variations there may be also variations in the amount found in different parts of the lake, the horizontal or areal distribution, and finally at any given time of year and point in the lake the plankton present may be unequally distributed in various levels of the water The last question, that of vertical distribution, may be subject to modification during the course of twenty-four hours as a result of periodic migration or of passive change in level on the part of the various components of the plankton. Each of these questions will be discussed in the light of the investigations made at Charlevoix.

It is evident that only long continued observations in any region can throw light on the first question, that of seasonal distribution. Thus far the only information on the yearly variations of the plankton in any locality comes from a paper by Apstein (92) in which is given the yearly curve of plankton volumes for Gross Plöner See in Holstein. This shows a rapid increase through August and September to the maximum which falls near the beginning of October and an equally rapid decrease from that time through November. The minimum occurs in February but the decrease to it and increase from it are gradual. It would be venturesome to hold that the seasonal variation in Lake Michigan was the same, yet a similar increase in amount with the rising temperature of the water and decrease with lowering of the same is altogether probable. If this be so our observations were made during the time in which the volume of plankton was approaching its maximum.

If long extended observations are necessary for the determination of seasonal variations, the reverse is true in the investigation of horizontal or areal distribution. In order to avoid the progressive yearly variations in the mass of plankton those observations which are to be used for comparison in determining horizontal and vertical distribution must be made within a limited time. It is evident then that the series of hauls made in Lake St. Clair and in Lake Michigan are peculiarly fitted for the discussion of these questions since each series fell within a limit of ten days; and since both were made at almost exactly the same season of the year they may safely be compared with each other also. The results possess great strength as scientific evidence since they are deduced not from single isolated experiments, in which error or chance may play a promiment part, but are based upon systematic observations numerous enough to eliminate chance and to show whatever errors may inhere in the methods employed. This cannot be too strongly emphasized in the light of a growing tendency to discover principles and to corroborate the work of other investigators on the evidence afforded by a single experiment!

The first element which may be considered in its effect on areal distribution is depth. The hauls made in the Charlevoix region are well fitted to afford evidence on this question since they cover very wide conditions in respect to depth. Omitting those few hauls which have already been set aside as experimental or failing to agree in some important particular with the others, the remainder may be grouped in four classes; the first three include those made in Lake Michigan and the fourth those from Round and Pine lakes. Class A includes Lake Michigan hauls made in water from 4 to 12 meters deep; B those from a depth of 20 to 42 meters and C comprises those hauls from water whose depth varies between 50 and 130 meters while in D are grouped all those made in Round and Pine lakes where the water was 4 to 30 meters deep. The hauls under D are not sufficiently numerous for subdivision although they evidently correspond to those of both A and B in Lake Michigan.

		Total No.
A.	Shallow hauls in Lake Michigan include XII, (XIV),[*] XV	6
B.	Medium " " " " " (II, IV,) IX, XIII, XVI, XVIII, XIX, XX, XXI, XXII	41
C.	Deep hauls in Lake Michigan include (I, III,) X, XI, XVII	22
D.	Hauls in smaller lakes include V, VI, VII, (VIII), XXIII, XXIV, XXV, XXVI	30
	Total number of hauls made	99

If for the various bottom hauls the total amounts of plankton obtained are brought together and then averaged for the separate groups, we have the following:

A. No. of Station	XII.	XIV.	XV.	Average.
Total volume in cc. of plankton obtained	1.35	3.61	2.95	2.64

B. No. of Station	II.	IV.	IX.	XIII.	XVI.	XVIII.	XIX.	XX.	XXI.	XXII.	Av.
Total volume in cc. of plankton obtained	5.08 4.20	9.50	6.41	7.91	6.98	4.95	? 11.90 [**]	6.08	4.90	5.60	6.16

C. Number of Station	I.	III.	X.	XI.	XVII.	Av.
Total volume in cc. of plankton obtained	9.74	7.52	5.90	9.41	8.86	8.29

Considering then the Lake Michigan stations alone it is evident that at least to the limit of our experiments, *the total amount of plankton increases with the depth of the water*. The average amount for all stations in Lake Michigan is obtained from the total average of the three tables, and reaches 6.16 cc., being curiously the same as the average amount for stations of medium depth. For comparison the table of total amounts for class D is given here.

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[*] Those in parenthesis are not available for the study of the various strata.

[**] Omitted in the average for reasons given on page 45.

D. Number of Station	V.	VI.	VII.	VIII.	XXIII.	XXIV.	XXV.	XXVI.	Av.
Total volume in cc. of plankton obtained	3.50	3.78	5.20	3.55 3.20	3.83	1.52	2.63	2.71	3.32

It must be remembered that Group D includes stations of all depths in Pine and Round lakes and ought to be compared with the sum of A and B rather than with any one or all of the Lake Michigan groups. From this it would appear that the total amount of plankton is somewhat smaller in Pine and Round lakes than it is in adjacent waters of Lake Michigan.

From Reighard's table of plankton hauls (pp. 29, 30) the average amount taken in all bottom hauls in Lake St. Clair is found to be only 0.63 cc. and for the four bottom hauls taken in Lake Erie 2.98 cc. It is difficult to compare these amounts correctly with each other or with the results given above, since the depth is different at each station; and there is furthermore no basis for comparison with the results obtained by other investigators with a vertical net of a different size. If, however, instead of taking the total amount of plankton obtained in each bottom haul, we compare the amount per cubic meter of water as found for each bottom haul by calculation and entered in the last column of the table, close comparisons can then be made between the different hauls. This is done in the following tables:

A. Number of Station	XII.	XIV.	XV.	Av.
Amount of plankton in cc. per cu. m. of water	5.68	8.16	5.34	6.39

B. Number of Station	II.	IV.	IX.	XIII.	XVI.	XVIII.	XIX	XX.	XXI	XXII.	Av.
Amount of plankton in cc. per cu. m. of water	3.82 3.20	4.91	4.46	4.77	5.38	2.49	5.98 *	2.68	4.08	2.41	3.82

C. Number of Station	I.	III.	X.	XI.	XVII.	Av.
Amount of plankton in cc. per cu. m. of water	1.64	2.70	2.01	1.52	1.23	1.82

D. Number of Station	V.	VI.	VII.	VIII.	XXIII.	XXIV.	XXV.	XXVI.	Av.
Amount of plankton in cc. per cu. m. of water	2.88	2.38	3.14	5.84 5.27	3.96	6.88	3.17	2.34	3.98

From these tables it appears that the volume of plankton per cubic meter of water is greatest at the shallower stations, and least at the deepest stations while the medium hauls retain a mean position with reference to the others. Before comparing the stations in class D it should be noted that there may be taken two sets of hauls corresponding to groups A and B; the first consists of VIII and XXIV, hauls having a depth of 4 to 11 meters, and agrees almost exactly with the limits of class A (4 to 12 m.) while the hauls V, VI, VII, XXVI from depths of 21 to 30m. correspond closely to the shallower half of class B. Hauls XXIII and XXV come between the two and are set aside for the moment. The average volume of plankton per cubic meter of water is for the first set 6 cc., a trifle less than the average of hauls in class A, and for the second set it is only 2.66 cc. which is much less than the average for class B. It should be noted also that the hauls correspond only to those in the shallower half of class B and this should have the greater amount of plankton per cubic meter of water if the principle just stated, namely, the decrease in amount of plankton per cubic meter of water with increase in depth of the water, holds true of the stations in general as it has already been shown to obtain in the artificial groups A, B, and C. And in fact the average for those stations in class B having a depth between 22 and 30 meters is 4.18 cc. which is nearly sixty per cent greater than the average amount from the stations of equal depth in Pine Lake. This seems to show first, that the average amount of plankton per cubic meter of water is somewhat less in Round Lake and in the shallow part of Pine Lake than in corresponding depths of Lake Michigan; and secondly that in the deeper portion of Pine Lake the amount of plankton per cubic meter of water is very much less than at stations of equal depth in Lake Michigan.

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* Not averaged; see pages 38 and 45.

Comparisons simply by figures such as the preceding are somewhat unsatisfactory in that they can not ordinarily be kept in mind or arranged in such a way that their interrelation becomes perfectly clear. So, for instance, in the sets of tables just given (pp. 42 and 43) it was shown that the total volume of plankton increases with the depth but the volume per cubic meter of water decreases under the same circumstances. This was clear as between the three artificial series of hauls, A, B, and C, of which averages were given. But the question is naturally suggested as to whether it also holds true of the terms of the series and to what extent it is regular or periodical. In other words, are the increase in total volume of plankton and the decrease in volume per cubic meter of water comparatively constant, or does one find sudden changes at certain points. It was in the course of studies upon these questions that I hit upon a method of representation which shows these relations most clearly and unmistakably.

If common "cross-section paper" of suitable size and ruling be employed and if the vertical lines be taken to represent stations and the horizontal lines distances or amounts, a line may be drawn connecting the various points denoting the depth of each haul, and this may be called the line of depths. Similarly, by connecting points, indicating the total volume of plankton obtained in a bottom haul at each station, a line of total volumes is obtained and in a like manner a line of volumes per cubic meter of water. The position of the lines will then indicate clearly the relations between the factors of depth, total volume and volume per cubic meter of water. This has been done for all the bottom hauls in Lake Michigan (Pl. I), which are arranged in order of depth so that the line of depth (D) turns continuously in one direction from the shallowest haul (XII) at one side of the plate to the deepest (XVII) at the other. The course of this line of total volumes (T) is not entirely in the single direction, but there are numerous retrogressive variations, the most marked of which is that made at the vertical XIX. This was a noticeable point in the first rough draft of the plate, and I set at once to work in order to find, if possible, the cause of such an irregularity, for, when there could be found no mistake in the calculation, the idea of a swarm came up at once since such an abrupt increase and decrease in comparison with the antecedant and the subsequent haul of nearly equal depth must have been due to the localized massing of the plankton, in full or in part, or to something foreign. It proved to be the latter; for in my field notes was entered against this haul (XIX^5) "full of sand (current?), probably poor for measuring," and at the time of measuring this tube of plankton I noted opposite the amount, "too much sand, throw out." By approximation from the hauls of (XVIII) and (XX), which agree closely in time, place, and general conditions, as well as in amounts at other depths, I judged the amount of true plankton to be about 7.5 cc. instead of 11.90 cc. as measured and entered in the table.* This haul is more fully discussed elsewhere in connection with the vertical distribution of the plankton. I have hence drawn a dotted line to indicate more nearly the true relation of the plankton for XIX. As far as the other variations are concerned, they are not sufficient to change or even mask the relation of this line of total volumes to the depth, and hence they may be passed here. It may be that they are due to a cause similar to that in the case just explained, but less in amount, or to errors in the instruments or methods employed, or finally to actual small variations from the normal in the amount of plankton in a certain place.

So far as the general tendency of this line (T) is concerned it agreed with the line of depth but shows also an individual variation. During the first part of its course it indicates a uniform increase in the total volume more rapid than the increase in depth; after a depth of about thirty meters has been attained, however, its direction is variable and uncertain until the sudden change in depth between X and XI where it marks an increase less decided than that in the depth. The slight decrease at XVII would be an equally slight increase were the amount for the haul of 50 meters at this station substituted for that from the bottom; that is the amount of plankton is approximately equal at the two stations XI and XVII. The relations between the depth and the total amount of plankton present may be summarized as follows: Up to about thirty meters of depth the amount of plankton found in the lake increases more rapidly than the depth, but beyond fifty meters decidedly less rapidly. Further experiments are necessary to determine whether there is comparative uniformity in amount or a slight increase for depths beyond one hundred meters.

The third line on this plate (R) joins points on the verticals of the various stations, indicating by their distances from the upper margin the amount of plankton in cubic centimeters per cubic meter of water, as shown in the last column of the table (pp. 32–34). In contrast to the line of total volumes last considered it may be called the line of relative volumes. It will at once be clear that it follows the opposite direction from the line of total volumes and shows a decided decrease from the shallower stations to the deeper. It is also most irregular in the first half of its course and there also departs most from the dotted line of averages which is almost coincident with it near the end. This is undoubtedly due in large part to the greater influence on the amount per cubic meter which is exerted by errors in the capture of the material or in measurement later, since the divisor, the depth of the water, is a smaller number for the shallower stations. An error of measurement for instance causes a greater departure from the normal when distributed over only eight meters of depth than when divided among fifty to one hundred meters.

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* Almost exactly the same result was reached by a more complicated method; see p. 88.

In the next place it is evident that local conditions influence most strongly the shallower stations. Some are sheltered by projecting shores or are on wide areas of shallow water where the temperature is higher than in a more exposed situation. Currents or winds may also accumulate plankton at such points or may reduce the average amount somewhat. All of these agencies are less likely to act unequally in the freer open waters. At some of the shore stations, which show the greatest variations from the average a current could be noticed but it was difficult on account of the wind and the roughness of the water to determine without special instruments which were not at our command, its direction and strength. The dotted line which is a part of the line of relative volumes is thought to indicate closely the average amount of plankton per cubic meter of water and the irregularities of the solid line (R) show then the variations from that average. It will be noticed that no variation is equal to one-third of the relative volume and that most of them are very much less than that. The extreme deflection at XIX is of course due to the same cause as that in the line of total volumes and the dotted line from XVIII to XX indicates a correction on the same basis as that already discussed for the line of total volumes.

It may be noticed that some stations are omitted from the chart. They are those mentioned on page 42 at which, owing to various causes, a series of hauls was not made and which on that account cannot be used in the following tables and in the discussion of the vertical distribution of the plankton. They are therefore omitted here also in order that the various charts may be capable of being exactly compared. If included, the lines on the chart would not have been materially altered.

The following conclusions may then be drawn from these studies as to the amount of plankton in Lake Michigan in the Charlevoix region.

I. The total volume increases with the depth, but more rapidly for depths up to about thirty meters than beyond that point.

II. The volume per cubic meter of water decreases as the water grows deeper. This decrease is irregular for the shallower stations, but comparatively constant in deeper water.

III. No variation is large enough to warrant the assumption of the existence of alternate densely crowded and barren areas in the water, i. e. of masses or "swarms" of the plankton as a whole.

On plate I^{B} are plotted the same lines for the stations, in Pine and Round lakes. A glance will suffice to show that the same conclusions may be drawn here also, the total volume of plankton obtained in the bottom hauls increases comparatively regularly with the depth and with approximately equal rapidity for all depths reached. However, all stations made, and in fact the extreme depth of the lake, fall within the thirty meter limit which was seen to be about the termination of the rapid increase in the total volume of plankton in Lake Michigan. The amount per cubic meter of water as shown by the line of relative volumes (R) decreases very rapidly in the shallower regions but remains comparatively constant for hauls of twenty meters or more. The numbers of hauls in Round and Pine lakes is rather small to use as the basis of general conclusions on the distribution of the plankton in these waters, but so far as they go they show exactly similar conditions to those prevailing in Lake Michigan.

In the comparison, which should be made only with the part of I^A lying to the left of the vertical XIII, however, it is noticeable that both the line of total volumes and that of relative volumes fall above the corresponding lines for stations of equal depth in Lake Michigan. With the exception of those at the shallowest station *all hauls in the smaller lakes show both absolutely and relatively less plankton than was taken in hauls of the same depth from Lake Michigan.*

I have taken from the table given in Reighard's report corresponding data on the depth, the total and relative volumes of the plankton for Lake St. Clair and have plotted them in a similar manner (Pl. III). The line of total volumes (T) increases slightly but with striking uniformity from the shallowest to the deepest station and throughout its course closely parallels the line of depth (D). The line of relative volumes (R) is somewhat irregular, especially at the shallower stations. A general tendency in its course is not pronounced but it certainly does not show a decrease with increase in depth. In other words the total amount of plankton per cubic meter of water, taken in bottom hauls in Lake St. Clair, seems to be nearly if not quite independent of the depth of the water.

The explanation of the apparent contradiction between this and the distribution of the plankton in the northern lakes as described above, is to be found in the widely different conditions which obtain in the two places. Only one station in Lake Michigan came within the limits of the deepest of the sixteen bottom hauls in Lake St. Clair. The meagre depth of the latter region is accompanied by minimal diferences in the temperature of the water at the top and bottom, 1° C. being the greatest difference recorded. In the next place the considerable inflow and outflow cause rapid exchange and continual mixing of the water at all levels and make Lake St. Clair merely an expansion in the course of a river. It is as such subject to widely different influences which yield results naturally unlike those that obtain in the deep and stable waters of the northern lakes.

In one respect the chart of hauls from Lake St. Clair affords even more decided evidence than those of Lake Michigan and Pine Lake. There is no difference considerable enough to warrant the assumption of the existence of swarms of the plankton as a whole.

The question of temperature was carefully studied but I was unable to detect any relation between the volume or variations of the plankton and the temperatures recorded at the various stations. I was also unsuccessful in discovering other factors which affect the areal distribution of the mass and am inclined to think that in the St. Clair and Charlevoix regions at least depth is the only prominent factor influencing the horizontal distribution of the entire mass of the plankton.

The entire discussion thus far has been based upon a study of the various bottom hauls, but there was made also at each station a series of partial hauls. The comparison of these partial hauls with each other and with the bottom hauls show some particulars with reference to the vertical distribution of the plankton as a whole which deserve consideration here. In the course of correspondence with Professor Reighard during the past year, he sent me a synopsis of the possibilities in the case which seems of much value in its bearings on the question under consideration as to warrant its reproduction here.

"The following conditions are possible with regard to the distribution of plankton in a body of water.

I. *The plankton may be uniformly distributed through the whole volume of water.* This condition is thought not to exist in nature.

II. *The plankton is unequally distributed, and the water may be divided into artificial strata* in which
  - A. *The volume of plankton per cubic meter of water is unequal for different strata of equal thickness but*
    - 1. *Equal for different parts of the same stratum.*—This is the condition to be expected from the nature of the environment which in so far as it is not influenced by currents, may be said to vary with the depth but to remain constant throughout any thin horizontal stratum. It is the condition defended by Apstein and would yield in all parts of a lake equal volumes for equal depths, whether hauls extended to the bottom or not.
    - 2. *Unequal for different parts of the same stratum;* in this case there are two possible groups of cases.
      - a. The inequalities of the strata may be so arranged as to compensate each other in such manner that in vertical columns of water of equal dimensions extending from the bottom to the surface there will always exist equal volumes of plankton in different parts of the lake. This would result from II. A. 1. in case migrations of large numbers of individuals occurred only vertically. This condition would yield equal volumes for equal *bottom* hauls but unequal volumes for some other equal hauls.
      - b. Or arranged without reference to each other so that vertical columns of water of equal dimensions and extending from surface to bottom will usually contain unequal volumes of plankton in different parts of the lake. This would result from I. or II. A. 1, by migration of masses of individuals horizontally or obliquely. Such migrating masses may produce local accumulations of any conceivable form or size, such as spheres, sheets extending horizontally or vertically, etc. They are thus capable of producing a wide range of variation in the volume of the plankton from bottom and other hauls.

The migrating masses may consist of all the species existing in the plankton and in the proportions in which they exist there—in which case the resulting local accumulations may be called *plankton swarms*; or they may consist of one or several species and might be called *species swarms*. Species swarms occurring in such way as to compensate one another would remain undetected by the volumetric method."

The work of the first day with the vertical net was experimental, and does not show any uniformity in the number or depth of the various hauls at each station, as given in the table, page 32. They cannot be used for this reason in the comparative study of the strata. In all hauls thereafter we distinguished a number of artificial strata as follows:

1. A surface stratum from 2 m. to the surface.
2. An intermediate stratum from 5 m. to 2 m.
3. An " " " 10 " " 5 "
4. An " " " 25 " " 10 "
5. A deep " " 50 " " 25 "
6. A " " " 100 " " 50 "
7. A " " below 100 "

Twenty hauls each were made for the first two groups, while only two fall in the last group, and in all calculations, except the first table where all hauls are recorded, these are included in the stratum above as from the bottom to 50 m. The amount of plankton under one square meter of surface obtained in the various hauls from Lake Michigan is shown in the following table:

Number of Station	IX.	X.	XI.	XIII.	XV.	XVI.	XVII.	XVIII.	XIX.	XX.	XXI.	XXII.
2 m. to surface	19.37	18.46	22.08	28.42	25.34	27.15	23.35	26.25	25.70	18.46	22.17	17.74
5 m. to surface	40.73	26.25	35.30	41.63	31.18	42.35	44.35	33.67	34.93	31.68	35.11	24.98
10 m. to surface	54.66	47.78	66.61	79.64	58.40	80.91	88.69	49.23	58.88	49.59	50.32	49.41
25 m. to surface	117.29	96.84	115.48	169.24	......	126.84	159.28	90.14	118.56	82.90	88.69	75.84
50 m. to surface	116.02	106.79	157.88	148.17	......	......	179.19	89.60	? ? ?	110.05	......	101.36
Bottom to surface	......	......	170.32	......	......	......	160.37	......	......	......	......	......
Depth of bottom haul	26	53	112	30	10	23.5	130	36	36	41	22	42

The amount for the deepest stratum in each column represents the haul from the bottom, this usually does not coincide exactly with the deep limit of the stratum, but its extent can easily be told by the depth of the station, which is given in the lowest line of figures.

Corresponding figures for the stations in Round and Pine lakes are given in the next table.

Number of Station	V.	VI.	VII.	XXIII.	XXV.	XXVI.
2 m. to surface	23.89	22.99	30.41	29.32	21.72	25.52
5 m. to surface	29.14	42.54	54.30	33.49	34.08	26.97
10 m. to surface	44.16	....	56.65	45.43	56.11	47.06
15 m. to surface	59.01	60.64	68.60	....	47.80	....
Bottom to surface	63.35	68.42	94.12	69.32	....	49.05
Depth of bottom haul	22	30	30	17 5	15	21.

If now the amount given for the surface stratum of any station be subtracted from the amount taken in the haul from 5 m. to the surface, the remainder may be held to represent the amount in the stratum from 5 m. to 2 m. In the same way we may obtain the amount for the stratum from 10 m. to 5 m. and for that from 25 m. to 10 m., as also for the strata from the bottom to 25 m. The results for the Lake Michigan hauls are given in the next table; they are, however, calculated to the nearest single decimal only.

Number of Station	IX.	X.	XI.	XIII.	XV.	XVI.	XVII.	XVIII.	XIX.	XX.	XXI.	XXII.
2 m. to surface	19.4	18.5	22.1	28.4	25.3	27.2	23.4	26.3	25.7	18.5	23.2	17.7
5 m. to 2 m.	21.4	7.8	13.2	13.2	5.8	15.2	21.0	7.4	9.2	13.2	11.9	7.2
10 m. to 2 m.	13.9	21.5	31.3	38.0	22.3	38.6	44.3	15.6	23.9	17.9	15.2	24.4
25 m. to 10 m.	62.6	49.1	48.9	89.6	------	45.4	70.6	40.9	59.7	33.3	38.4	26.4
50 m. to 25 m.	-1.3	10.0	42.4	-26.1	------	------	19 9	-0.5	? ? ?	27.2	------	25.5
Bottom to 50 m.	------	------	12.5	------	------	------	-18.3	------	------	------	------	------
Depth of bottom haul	26	53	112	30	10	23.5	180	36	36	41	22	42

These artificial strata are, however, of very different thickness and in order to compare the amounts contained in them with each other it is necessary to reduce them to a common term, namely, the amount of plankton per cubic meter of water. This is done by dividing the total amount in any stratum for any station by the thickness of the stratum, and the results are given in the next table.

Number of Station.	IX.	X.	XI.	XIII.	XV.	XVI.	XVII.	XVIII.	XIX.	XX.	XXI.	XXII.	Average.	
													Vol-ume	Per cent.
Amount per cu. m. in stratum 0-2 m.	9.7	9.2	11.0	14.2	12.7	13.6	11.7	13.1	12.9	9.2	11.6	8.9	11.5	*47.5*
In stratum 2-5 m.	7.1	2.6	4.4	4.4	1.9	5.1	7.0	2.5	3.1	4.4	4.0	2.4	4.1	*16.9*
" " 5-10 m.	2.8	4.3	6.3	7.6	4.5	7.7	8.9	3.1	4.8	3.6	3.0	4.9	5.1	*21.1*
" " 10-25 m.	4.2	3.3	3.3	6.0	------	3.4	4.7	2.7	4.0	2.2	3.2	1.8	3.5	*14.4*
" " 25-50 m.	-1.3	0.4	1.7	-5.2	------	------	0.8	-0.0	? ? ?	1.7	------	1.5	0	------
" " 50 m. to bottom	----	----	0.2	----	------	------	-0.2	------	------	------	------	------	0	------
Depth of bottom haul	26	53	112	30	10	23.5	180	36	36	41	22	42	----	------

It is at once apparent that the surface stratum contains a much greater amount, than any other stratum, on the average more than twice as much. The intermediate strata are not far from equal, and the deeper strata are almost without plankton. Reighard found in Lake St. Clair that the amount in the surface stratum which in his experiments was taken to be only of one and one-half meters in thickness, was greater than the total amount below, but this was evidently due to the shallowness of the water. In Lake Michigan it was nearly true of the shallowest station in the table (XV), but at all others the total amount below the two meter level was much greater than that above that line. Proportionally, however, the surface stratum is always much richer than any of those below it. In this connection it should be pointed out that the upper level, be it 1.5 or 2 m., is most susceptible to error. The time is estimated with great difficulty and hence the velocity is hardly correctly obtained. When an average velocity is made the basis for the correction of all hauls, as in the table used here, this difficulty is of little importance. More weighty errors are due to wave motion and to the difficulty of limiting exactly the depth desired since the error is a much greater part of the whole than the same amount would be for deeper stratal hauls. One would expect, however, errors in both directions, and since the *minimum* amount of plankton in the surface stratum is more than the *maximum* amount in any other deeper stratum it is evident that the difference in the true volumes of the strata is greater than double the possible error. Furthermore, the fluctuations in the amount of plankton contained in the surface stratum are not due to this alone since they are no greater than the variations for other strata where these errors play a lesser and evidently somewhat insignificant part.

The amounts in the various strata in Pine and Round lakes are obtained in like manner, by subtraction, and are as follows:

Number of station	V.	VI.	VII.	XXIII.	XXIV.	XXV.	XXVI.
2 m. to surface	23.9	23.0	30.4	29.3	29.0	21.7	25.5
5 m. to 2 m.	5.3	19.6	23.9	4.3	-1.5	12.3	1.5
10 m. to 5 m.	15.0	18.1	2.4	11.9	----	22.1	20.1
15 m. to 10 m.	14.9		12.0	23.9	----	-8.5	2.0
Bottom to 15 m.	4.3	7.8	25.5		----	----	
Depth in meters	22	30	30	17.5	4.	15	21

If, now, the amounts per cubic meter of water in each stratum be found as before, the table becomes:

Number of Station	V.	VI.	VII.	XXIII.	XXIV.	XXV.	XXVI.	Av. volume.	
								In cc.	Per cent.
Amount per cu. m. in stratum 0—2 m.	11.9	11.5	15.2	14.7	14.5	10.9	12.8	13.1	*64.8*
In stratum 2 to 5 m.	1.8	6.5	8.0	1.4	-0.7	4.1	0.5	3.1	*15.3*
" " 5 to 10 m.	3.0	1.8*	0.5	2.4	----	4.4	4.0	2.7	*13.3*
" " 10 to 15 m.	3.0	1.8*	2.4	3.2	----	-1.7	0.2	1.3	*6.5*
" " 15 m. to bottom	0.6	0.5	1.7		----	----			
Depth of haul in meters	22	30	30	17.5	4	15	21	----	----

Here again it is evident that the surface stratum contains much more than any equal amount of water below it, in every case at least twice as much, and on the average four times as much as any other stratum. Both the average and the extremes show that the surface stratum in Round and Pine lakes contains noticeably more plankton than the surface stratum in Lake Michigan. The deeper strata, however, appear to be decidedly poorer than those in Lake Michigan.

The results given in these last two tables are much more easily examined when represented graphically, as in Plate II. As before, the vertical lines represent stations and the horizonial lines volumes or depths as indicated at the margin. The order of the various stations is the same as that of Plate I, and the dotted line of depth (*D*) is repeated here for convenience.

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* These were not taken as two separate hauls but together as one. See table page 32.

The points representing volumes of plankton per cubic meter of water at various depths are connected to form lines, *S* of the surface stratum, 2–5, 5–10, etc., of the other strata. The interrogation points on XIX indicate, in the case of the one at 8.8 cc. the total actually obtained for the stratum 25–50 m., sand and all included (see p. 45), and in the case of the upper mark, a possible true value for the plankton less sand and other extraneous matter. At VIII the mark indicates that the observation for this depth is lacking. The line *B* on Plate II^A represents the stratum 15 m. to bottom, which does not correspond exactly to any in Lake Michigan. Otherwise the strata are represented by similar lines on the two portions of the chart.

The results from Lake Michigan (II^A) may well be considered first separately from those of Round and Pine lakes (II^B). The line (*S*) of volumes in the surface stratum (0–2 m.) pursues a somewhat irregular course from one side of the chart to the other. The irregularities in it are independent of the depth and, as comparison with Plate I^A shows, also of the total volume and of the relative volume of plankton. I have plotted on charts not given in this report the fluctuations for these hauls in temperature of this stratum and in time of day without finding any general agreement between them and the variations in the amount of plankton in the surface stratum. These latter may be due in part at least to errors in the apparatus, in the methods of obtaining, or measuring the plankton, or they may depend upon the combined effect of several causes. At present, however, the irregularities must be left unexplained.

The lines representing the three intermediate strata occupy a mean position on the chart. They are subject to very considerable variations which bring first one and again another uppermost, but which are never sufficient to confuse any one of them with the lines of the surface stratum or of the deeper layers. On the plate the line of volumes per cubic meter of water in any stratum is marked by the limits of the stratum, *eg.* 2–5 m., but in the discussion each may well be designated by the numeral of the deeper limit of the stratum, thus the 5 m. line would indicate the line of plankton volumes per cubic meter of water in the stratum 2–5., or bottom if shallower than 5 m.

The 5 m. line shows no relation to the line of depth, nor to that of the surface stratum, and only an uncertain parallel to the line of total volumes (Plate I^A), as if it in general influenced the direction of the latter. The 10 m. line appears to have no fixed relation to the line of depth, to that of total volumes, or to the 5 m. line. There is, however, a striking agreement in direction with the line of the surface stratum; what may be the significance of this I am unable to say. At one station (IX) only is the 10 m. line on the chart, far above the 5 m. line, at two (XXI, XX) it is a little higher and at all others decidedly lower, thus indicating more positively than the average of the table (p. 50) that the 5–10 m. stratum contains more plankton per cubic meter of water than the 2–5 m. stratum. At IX the 2–5 m. stratum seems to have gained plankton at the expense of both the surface stratum and that of immediately below itself (5–10 m.) The possible significance of this will be discussed later.

The 25 m. lines shows no particular relation to the lines of depth, of total volumes, or of the surface stratum. It is more nearly parallel to the 5 m. line than to the 10 m. line, and on the chart lies below the latter in one case only (IX) while it is above the 5 m. line in seven cases and below in four. The amount of plankton per cubic meter of water is, then, in the 10–25 m. stratum clearly less than in the 5–10 m. layer and considering the number of cases more nearly equal to the amount per cubic meter of water in the 2–5 m. stratum than the average of the table (p. 50) would indicate. The amount of plankton in the intermediate strata is variably more or less, and relatively nearly the same for the various stata, but always much less than in the surface stratum and equally clearly more than in the deeper strata. It is less than zero in one instance only, for the 2–5 m. stratum at XII.,* where the depth of the haul is only 4.3 m.

The 50 m. line shows no apparent relation to any of the others; it indicates a negative amount of plankton in at least three cases IX, XIII, XVIII, and never more than a very small positive amount. The same is true in still greater degree of the 100 m., or bottom line, which lies once just above and once just below the zero line. The amount of plankton per cubic meter of water in the deeper strata is thus clearly shown to be exceedingly small.

In Round and Pine lakes (Plate II^B) the relations are substantially the same. The line of the surface stratum stands for a little larger amount and shows less extreme fluctuations. The intermediate strata contain much less plankton and are much more variable in quantity. The high average of the 2–5 m. stratum in the table (p. 51,) is seen from the chart to be due evidently to the enormous bend in the line at VI and VII; at all of the other stations the 10 m. line shows a greater amount of plankton than the 5 m. line. There are in the shallower water of these lakes no strata corresponding to the deep ones of Lake Michigan, and the 10–15 m. stratum corresponds only to the upper third of the corresponding (10–25 m.) stratum in the large lake. In comparing these results with those in Lake Michigan it should be remembered that the meagre depth 30 m., of the deepest station entitles us to consider only the right hand portion of the other chart (II^B) up to and including XIII. The number of stations in Lake Michigan of equal depth is about the same as the total number in Round and Pine lakes.

In Lake St. Clair Reighard made hauls from 1.5, 3.0, 4.5 metres and bottom; if the second and third be added to the strata become 1.5, 4.5 and bottom which corresponds nearly with our strata of 2 m., 5 m., and bottom in the shallowest hauls. Combined in this way the hauls from Lake St. Clair yielded the following results where the volume of plankton under 1 square meter of surface is given in cubic centimetres.

Number of Station	II.	III.	V.	VI.	VIII.	IX.	XV.	XVI.
In stratum 1.5 m. to 0	10.3	15.8	11.1	8.0	9.4	7.6	7.5	7.1
" " 4.5 m. or 5 m. to 1.5 m.	0	-2.3	2.5	4.8	3.3	3.0	6.4	2.5
" " bottom to 4.5 m.		4.9	3.1				-3.0	
Depth of bottom haul in meters	5	5.5	5.3	4.8	4.4	4.3	5.2	4.6

By dividing in each case by the number representing the thickness of the stratum, the amount per cubic meter in each stratum will be obtained. It is given in the next table:

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* By the use of the method of subtraction the amount of plankton in any stratum may become apparently less than zero where the total amount in the stratum is less than the fluctuations in the measured amount of the plankton in the superjacent water whether those fluctuations are due to errors in apparatus employed, in calculation or in measurement, to actual variations in the amount of plankton present, or finally to a combination of these causes. It will then evidently be most likely to occur where the depth of the bottom stratum is only small and where it is poorest in plankton. Instances of negative plankton quantities due to the limited thickness of the bottom stratum are probably XII, IX, XIII, to poverty of the bottom stratum XVIII, XVII, though both causes undoubtedly affect some of the cases to a certain degree.

Number of Station............	II.	III.	V.	VI.	VIII.	IX.	XV.	XVI.	Av.
In stratum 1.5 m. to 0	6.9	10.5	7.4	5.3	6.3	5.1	5.0	4.7	6.4
" " 4.5 or 5 m. to 1.5	0	-0.8	0.8	1.5	1.1	1.1	2.1	0.8	0.8
" " bottom to 4.5 m.....	....	4.9	3.9	....	....	....	-4.3	....	1.5

Compared with the averages from Lake Michigan and Round and Pine lakes as given in the tables, pp. 50 and 51, it is at once evident that the surface stratum in Lake St. Clair, contains only about half as much plankton as that in the other lakes; there is still less in the second stratum. The bottom layer was present in so few cases that one can not draw any inferences from the exceedingly variable amounts given in the table above. They show, however, on the average about half as much as is found in the third stratum in Round and Pine lakes.

When these results are plotted (Plate III) it is seen that the amount per cubic meter in the surface stratum undergoes a gradual increase with increasing depth. This, which was not true of the waters of the Charlevoix region, may be a characteristic of the extremely shallow water. One can think that the true plankton forms do not reach the conditions for most favorable development until further removed from the influence of the bottom than the meagre 2 to 3 meters of the shallow hauls in Lake St. Clair. This supposition is apparently strengthened by the facts shown in the average of the table on the preceding page and is still more clearly evident on the plates.* The amount of plankton in the surface stratum is only about half as much in Lake St. Clair as in the northern waters, but in the deepest water of the former lake the amount is about the same as the smallest quantity recorded in the Charlevoix region. I am inclined to believe then that the amount of plankton in the surface stratum increases with the depth for very shallow waters until a certain maximum is approximated, and then is independent of the depth of the water. This is, however, hardly more than a working hypothesis at present and deserves further careful investigation.

The stratum 4.5–1.5 m. shows a certain decrease with increasing depth of water, the reverse of conditions in the surface stratum while the few observations on a deeper stratum, bottom to 4.5 m., agree in general tendency to increase with the surface stratum. The amount in the middle stratum is evidently far below that in the northern lakes and the variations are more intense since the amount of plankton present becomes nearly zero more than once. In this respect, the lines on Plate II^{B}, for Round and Pine lakes agree more nearly with Lake St. Clair than do those of Lake Michigan.

The peculiar tendency of proximate strata to show variations in opposite directions is evident in Lake St. Clair as well as in Lake Michigan, in connection with which the matter is discussed. Here it is only necessary to say I regard this peculiarity as evidence of vertical migration of part or all of this plankton under circumstances not yet known.

One feature deserves further discussion. No doubt it has already been noticed that the comparison between stratal hauls in the lakes is open to criticism since in Lake St. Clair the limits are not the same as in the northern lakes studied. It is true that as yet no definite information is at hand as to the exact position in a stratum which the mass of the plankton holds and if in Lake St. Clair a considerable part of the plankton from the stratum 1.5–4.5 m. were to have been found in *the upper half meter* of that stratum the total for the surface two meters would more nearly or quite equal that in the same limits in Lake Michigan. In the work on Lake St. Clain the stratal hauls employed were 1.5–0, 3.0–0, 4.5-0, and bottom –0. Now it is a curious fact, and perhaps not without bearing in the present discussion, that the method of subtraction gives for the four strata an average amount of plankton per cubic meter of water of 6.4, 1.6, –0.1, and 1.5 cc. That is of the two layers, each one and one-half meters thick, which constitute the stratum 4.5–1.5 m., most nearly corresponding to that of 5–2 m. used in the Charlevoix work, *the deeper one contains on the average a little less than nothing.* This shows distinctly that the bulk of the plankton in Lake St. Clair, between the limits of 4.5 and 1.5 meters is accumulated in the upper half of the stratum; how much more narrowly it is limited cannot be told. Hence it may still be true that the upper two meters contains an amount equal to the surface stratum in Lake Michigan. If this is so, however, it is all the more true that the deeper water contains a minimal amount of plankton, far below that which is found in the waters of the Charlevoix region.

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* Plates I, II, III, are all drawn on exactly the same scale.

One interesting general relation deserves special notice here though it has already been hinted at in the preceding. There seems to me to be evidence of opposite variation in adjacent strata and of parallel variation in strata once removed from each other, i. e., decrease in the surface stratum seems to be accompanied in a majority of instances by increase in the 2–5m. stratum and decrease in the 5–10m. stratum; and at least one of these two fluctuations appears to be generally characteristic of changes in any line. I am inclined to think this is evidence of vertical migration, under circumstances not yet apparent, of some elements of the plankton which, being normally near the artificial line of separation of two strata such as we used, would cause contrary variations in the two strata by passing from the one into the other. Reighard (93, p. 35) gives similar evidence of vertical migration by the contrary variation of proximate strata in Lake St. Clair. The solution of such questions depends, however, upon the location and movement of the species which constitute the plankton.

In the work of Apstein on the Lakes of Holstein, the artificial strata employed were 0 to 2 meters, 2 to 10 meters and 10 meters to bottom. To compare the results of this work on Lake Michigan with his the amounts for the various strata must be added so as to give layers corresponding here to those he employed. If the table on p. 50 be treated so as to combine the strata in this way, the following table is made, showing in cc. the volume of plankton under 1 sq. m. of surface for each stratum at each station:

Number of Station	IX.	X.	XI.	XIII.	XV.	XVI.	XVII.	XVIII.	XIX.	XX.	XXI.	XXII.
2 m.—surface	19.4	18.5	22.1	28.4	25.3	27.2	23.4	26.3	25.7	18.5	23.2	17.7
10 m.—2 m.	35.3	29.3	44.5	51.2	28.1	53.8	65.3	23.0	33.1	31.1	27.1	31.6
Bottom—10 m.	61.3	59.1	103.8	63.5	......	45.4	71.7	40.4	* 16.5	60.5	38.4	51.9

* Estimated.

Or reduced as before to common terms for comparison.

Number of Stations	IX.	X.	XI.	XIII.	XV.	XVI.	XVII.	XVIII.	XIX.	XX.	XXI.	XXII.	Av.
Amount of plankton per cu. m. of water in surface stratum	9.7	9.2	11.0	14.2	12.7	13.6	11.7	13.1	12.9	9.2	11.6	.8.9	11.5
In 2—10 m. stratum	4.4	3.7	5.6	6.4	3.5	6.7	8.2	2.6	4.2	3.9	3.4	3.9	4.7
In 10 m.—bot'm stratum	4.4	1.4	1.0	3.2	......	3.4	0.6	1.6	*1.5	2.0	3.2	1.6	2.2

If now the amount of plankton in the bottom stratum of each station in the above table be taken as a unit for that station and the upper strata expressed in terms of it, the results will show the relative distribution of plankton. This has been done in the next table.

Number of Station	IX.	X.	XI.	XIII.	XVI.	XVII.	XVIII.	XIX.	XX.	XXI.	XXII.
Surface stratum	2.2	6.6	11.0	4.4	4.0	19.5	8.2	8.6	4.6	3.6	5.6
2 to 10 m. stratum	1	2.6	5 6	2.0	2.0	13.7	1.6	2.8	2.0	1.1	2.4
10 m. to bottom	1	1	1	1	1	1	1	1	1	1	1

Apstein has made similar comparisons for one of the largest of German lakes, Dobersdorfersee near Kiel, and gives the following table of relations for that body of water, which has however only the limited depth of 20 m. at most.

Date	VII. 5	VII. 19	VIII. 2	VIII. 30	IX. 20	X. 4	X. 11	XI. 15	III. 27	IV. 13	V. 11
Number of haul	26	27	28	30	32	33	34	37	41	43	46
Stratum 0 to 2 m	1.7	2	4.2	3.9	7.9	1.7	2.9	4.2	6.8	2.5	3.8
" 2 to 10 m	1	1	0.9	3.9	2.9	0.2	0.6	1	2	0.5	0.9
" 10 to 20 m	1	1	1	1	1	1	1	1	1	1	1

The date of our work was August, so that comparisons should be made properly only with the first three hauls of this table; they are, however, all much alike, and show greater uniformity than those from Lake Michigan given in the preceding table. This is no doubt due to the difference in depth, for the two deep stations in Lake Michigan, XI with 112 m., and XVII with 130 m., are just the ones in which the surface stratum is extremely large in proportion to the deep stratum. The other stations, especially the shallower ones, IX, XIII, XVI, XXI, show a proportionate distribution of plankton approximately like that found by Apstein. This is the more unexpected and interesting when the amount of plankton in the two lakes is considered, for Dobersdorfer See is rich in plankton, whereas Lake Michigan belongs to those lakes denominated plankton poor. Hauls of equal depth show the latter very clearly.

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* Estimated.

	Lake Michigan.				Dobersdorfer See.			
Number of haul	XII.	XIV.	XV.	XXI.	25	27	26	27
Depth of haul in meters	4.3	8	10	22	5	7	18	19
Total amount of plankton in cc. under 1 sq. m. of surface	27 24	-------- 65	-------- 53	-------- 89	379 530	-------- 227	909 909	530 720

In hauls from equal depths there is about ten times as much plankton under 1 sq. m. of surface in Dobersdorfer See as is found in Lake Michigan. Yet not only is the amount in the surface stratum of both greater than the amount in any other equal portion of the water, but it is also true that the two lakes show a greater similarity in percentage of vertical distribution of the plankton. This may be formulated as follows:

*Partial vertical hauls from equal depths yield equal volumes in the same lake, and equal percentages in different lakes.**

If we consider the relations shown by the lines on Plate II^A, a more natural combination of the strata used in the work on Lake Michigan than that used by Apstein for those of Dobersdorfer See, would be, (1) the surface stratum alone, richest in plankton; (2) the three intermediate strata, nearly equal to one another in amount of plankton present in each; (3) the deep strata uniformly poor in plankton.

For comparison the results are brought together into another table which gives the amount of plankton in cubic centimeters under one square meter of surface for the three sets of strata:

Number of station	IX.	X.	XI.	XIII.	XVI.	XVII.	XVIII.	XIX.	XX.	XXI.	XXII.
2 m. to surface	19.4	18.5	22.1	28.4	27.2	23.4	26.3	25.7	18.5	23.2	17.7
25 m. to 2 m.	97.9	78.4	93.4	140.8	99.2	135.9	68.9	92.8	64.4	65.5	58.0
Bottom to 25 m.	-1.3	10.0	54.9	-26.1	------	1.1	-0.5	?	27.2	--------	25.5

By dividing the total amount in each stratum by the thickness of the stratum for each station, the table shows the amount of plankton in cubic centimeters per cubic meter of water at each station:

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* Since writing the above I have seen a paper by Walter (95). He speaks of quantitative plankton measurements as "an invaluable aid in the investigations" of the shallow breeding ponds on which he worked, and prefers measurements to weighing for their convenience and accuracy. The paper is almost exclusively devoted to methods, but one general principle of plankton distribution, cited without the data on which it is founded, deserves mention here. He says: "In a cubic meter of water taken from a shallow area the amount of plankton is greater than in a cubic meter from a deeper place," and further "I do not know to what extent this is true of deeper bodies of water." As will be seen, this is a somewhat general statement of the relations between the depth and the amount of plankton which are discussed more precisely in the preceding pages. Independent and concurrent observations on the value of plankton measurements and on the variation in amount with depth in bodies of water affording such sharply contrasted conditions as the shallow carp ponds and the Great Lakes are certainly powerful arguments for the accuracy of plankton studies and also in support of the general principles elucidated in this particular case.

The importance of depth as a factor in determining the amount of plankton is further evident from the observations of Zacharias (95). He states (p. 119) that there is an evident dependence of the amount of plankton on the depth of the water, but what may be the interrelation is not stated more exactly in that place. An examination of his records of hauls shows that it must be in general the same as that we found in Lake Michigan and elsewhere. It should be noted that only series of hauls made within a comparatively limited time can be compared for this purpose, since the well-known seasonal variations in the plankton certainly affect markedly the volumes of hauls made at considerable time intervals from each other.

Number of Station	IX.	X.	XI.	XIII.	XVI.	XVII.	XVIII.	XIX.	XX.	XXI.	XXII.	Av.
In stratum 0 to 2 m.	9.7	9.2	11.0	14.2	13.6	11.7	13.1	12.9	9.2	11.6	8.9	11.5
" " 2 to 25 m.	4.3	3.4	4.1	6.1	4.3	5.9	2.8	4.0	2.8	2.8	2.5	3.9
" " 25 m. to bottom	-1.3	0.4	0.6	-5.2	......	0	0.	?	1.7	......	1.5	?
Thickness in meters of deepest stratum	1	28	87	5	......	105	11	11	16	......	17	......

If for each station of this table the amount of plankton in the intermediate stratum be taken as a unit, and the amounts in the surface and deep strata be expressed in terms of this unit, the result is as follows:

Number of Station	IX.	X.	XI.	XIII.	XVI.	XVII.	XVIII.	XIX.	XX.	XXI.	XXII.	Av.
Surface stratum	2.3	2.7	2.7	2.3	3.2	2.0	4.7	3.2	3.3	4.1	3.6	3.1
Intermediate stratum	1	1	1	1	1	1	1	1	1	1	1	1
Deep stratum	-0.3	0.1	0.1	-0.8	......	0	0	......	0.6	......	0.6	0.0

This table demonstrates once more and clearly that (1) the surface two meters contain much more plankton per cubic meter of water than any stratum below it, and (2) the deep stratum is practically devoid of plankton in comparison with the upper portions of the water.

This relative superiority of the surface stratum in plankton contents was first demonstrated in European lakes by Apstein. As already noted these lakes are of limited area and depth, and moderate inflow and outflow. Reighard found the same plankton distribution in Lake St. Clair which is greater in area, less in depth and extremely unstable in volume owing to the enormous inflow and outflow. The observations recorded here serve to show similar conditions in the Charlevoix region of Lake Michigan, which, even in the limited region examined, is much larger in area, many times greater in depth and extremely stable in volume owing to the small inflow and outflow. At the same time we found like conditions in Round and Pine lakes, one very small and changeable, the other large and comparatively stable. In the light of these observations on widely separate and extremely dissimilar bodies of fresh water, it may fairly be assumed to be a general truth that the surface stratum contains more plankton than any other equal portion of the water. In Lake Michigan, as also in Round and Pine lakes it was equally true that the amount of plankton in the surface stratum is independent of the depth.

The question naturally suggests itself as to the distribution of the plankton within this stratum. The surface towings in Round and Pine lakes and Lake Michigan were ordinarily made at about 8 a. m., and the blanks on which were recorded the daily catches show unmistakably that the plankton at the immediate surface contained algæ and rotifers, but only very rarely crustaceans and then but few of them. The amount of these tows was never taken carefully and measured but they showed themselves at a glance to be meagre in comparison with towings from deeper levels. In order to test the matter more carefully I had a net of peculiar pattern constructed. From its general appearance it received at the hands of the party the name of "torpedo" net. A cylinder of wire gauze was reenforced by bands of brass at both ends and by three longitudinal brass wires of one-eighth inch in diameter, soldered to the gauze and strengthened by external hooks of wire. The front end was provided with a tight fitting, solid funnel which had external eyelets so that it could be firmly fastened to the ends of the longitudinal rods on the outside of the cylinder. Three of these funnels were used, having openings of 0.5, 0.75, and one inch in diameter. The other end of the cylinder was also closed by a funnel but of gauze with an oil can top at the end. The inside of the cylinder and of the lower funnel was lined by a net of fine India linen. From the cord which towed the net a lead weight was suspended about a foot in front of the mouth of the front funnel. Thus equipped it could be drawn behind our fishing tug at full speed and yet remain well below the surface of the water. The amount of water which could enter was regulated by the opening of the funnel and was small enough to allow of its filtering through the large lateral area of the net so as to leave the plankton in good condition. The material washed back along the sides of the net and collected in the rear funnel from which it was taken when the net was hauled in. We dragged this net for several days during our trips on Lake Michigan and for hours at a time. Yet the amount of plankton obtained was exceedingly small. No reason can be given why the water should not have passed through the net in large quantities during these long trips and so far as we could see it did. There was no means at hand of measuring the amount filtered and of recording the permanency of the stream entering the funnel; this is of course the vulnerable point of the evidence. Apparently, however, the apparatus worked well and continuously, and unless some reason can be found why the plankton could not enter the net, we are forced to grant that at that time of day the amount of plankton in the upper foot of water is practically *nil.** These experiments were made during the day. Unfortunately there was no opportunity to repeat them after nightfall. Surface towings were, however, made in Round and Pine lakes from a row boat after dark. With the same net, in the same way and at the same place, where in daylight a scanty collection of rotifers and algæ was made, the darkness yielded a rich haul including multitudes of crustacea. It was only the upper six to twelve inches of the water which was filtered in both cases. This evidence, scanty and incomplete as it certainly is, still points, to my mind unmistakably, to the existence of diurnal migrations on the part of the crustaceans at least. This well known occurrence in salt water has been found by Francé (94) to take place in the case of fresh water forms in Lake Balaton, Hungary; Marsh (94) has also observed it in Green Lake, Wis. In a recent publication Birge (95) denies the existence in Lake Mendota, Wis., of such migrations at least beyond the limits of three meters. I have already called attention to the fact (p. 55), that vertical migrations, carrying large numbers of a species over the limits of the artificial strata used in the lake work, would cause the compensatory fluctuations in adjacent strata as shown on the plates. It is true that if the hauls made in the Charlevoix region are plotted with reference to the time of day there does not seem to be any correlation between the time of the hauls and the variations in amount. Of course it should be noted that the hauls we made were never very late in the day and the supposed vertical migrations may have been due to entirely different causes if, indeed, they actually occurred.

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* While very kindly reading the proof, Prof. Reighard called my attention to the fact that he reached a similar conclusion in a paper read before the American Fisheries Society (see Report for 1892). Neither the paper nor the volume are accessible to me at date of writing.

I have already called attention to the compensatory fluctuations in the plankton of adjacent strata from Lake St. Clair; these are very striking if one examines the results given by Reighard for the strata of only 1.5 m. in thickness and are *more than half of them eliminated by combining the two strata 1.5-3 m. and 3-4.5 m.* Mention has also been made above of the comparative barrenness of the lower half of the stratum 1.5–4.5 m.

All of the peculiarities noted in this connection point in one direction and justify the conclusion that *the distribution of the plankton within the limits of an artificial stratum is very unequal; the variations in its distribution are probably due to vertical migration.*

One further question in vertical distribution demands brief consideration. We have seen that the amount of plankton per cubic meter of water varies inversely as the depth from which the water is obtained. Does the volume decrease constantly from surface to the bottom or is there near the latter an increase, an accumulation of forms more or less dependent upon the bottom? No exact observations were made to determine this point, but some data bearing upon the question were recorded. In the qualtiative studies made during the first two weeks on Round and Pine lakes, and Lake Michigan it was customary to have a tow taken by an ordinary surface net and and also one taken by a runner net drawn along the bottom. This was let down open through the water and drawn up open also, so that its contents were in no sense strictly bottom forms, nor was there any means of using them in quantitative determinations. It was customary to draw both this bottom net and the surface net about an equal length of time. Now while we noticed from the first that the surface net, as already mentioned, obtained but a small amount of material, chiefly Rotifera and Protozoa, it was also remarked that the bottom net brought up a host of specimens, and that these were almost entirely Crustacea. The mass of material was composed, as examination showed, of only a few species, but these few were present in such enormous numbers of individuals as to make the catch a veritable "soup." In my daily note book this richness of the bottom tow was commented on for days until we recognized it as a constant occurrence and among the notes I find the statement that the tow appeared as rich in quantity as any evening surface tow on the ocean. I was in fact thoroughly astonished to find such masses in fresh water catches. There was practically an entire lack of the numerous insect larvæ which make the volume of some fresh water hauls so great; the tow consisted of almost nothing but myriads of Copepoda. Now these were either migrants from the superjacent water or permanent residents of a zone near the bottom. The vertical hauls gave no evidence of the existence of this mass of Crustacea near the bottom, although the hauls were made at the same place and at corresponding times of day. I wish to point out here some faults in this negative argument and to emphasize the fatal error in placing entire dependence upon hauls of a *vertical* net. In the first place the impervious canvass cone brings the actual opening of the net about 40 cm. above the bottom when the net is actually resting upon a flat surface; stones and other objects as well as inequalities in the surface may increase this distance considerably. Again, the net is lowered to the bottom, rests there a second and is then hauled steadily to the surface. The bucket hanging below makes some disturbance in the water before the cone reaches the bottom, and the strong swimming forms, such as *Limnocalanus*, and other Copepoda, would have abundant opportunity to escape from the dangerous ground above the cone, the place of greatest disturbance and hence the point from which the fugitives turn. Both of these reasons would naturally tend to lessen the number of bottom forms taken in vertical hauls. The runner net also gave evidence of a considerable number of *Mysis* near the bottom, but as might be expected they were taken only rarely and by twos or threes in the vertical net.

This is the vertical distribution characteristic of the warmer season of the year when, not only in respect to light but also in regard to temperature, the surface stratum is much the most favorable portion of the water for growth. In regard to only one of these factors do the conditions remain the same throughout the year, the light supply is uniformly greater at the surface in all seasons, but during the fall it is known that the temperature of the water becomes more and more uniform throughout and finally in the winter the deeper strata are actually warmer. I know of only one observation as to the effect of this change in temperature on the relative populousness of the various strata. Birge (95, p. 480), records that during the fall the distribution becomes more and more uniform throughout the water and that the surface stratum does not show any superiority in the amount of plankton present in it. If this be confirmed for other bodies of water it will be evidence that the factor of temperature has more effect on the distribution of the plankton than the light.

No opportunity has yet been found for qualitative work on the hauls of the vertical net. The counting of such a mass of material would involve more time than it has been possible for me to devote personally to that purpose and no other opportunity has yet offered itself. I am personally skeptical of the value of enumeration under ordinary circumstances and most of all of such efforts as are not extended throughout the year to afford a basis for estimating the rise and decline of various species.

It is evident of course that not all the plankton is equally valuable as fish food and not all of it seems directly or indirectly to form marketable fish. As has already been mentioned the Crustacea form the most important element from the standpoint of the fish culturist. While I with the assistance of one or more members of the party, was taking hauls with a vertical net at one side of the boat, Professors Birge and Marsh with some assistance were securing stratal hauls of Crustacea alone at the other side of the tug. Each of these gentlemen, who contributed so much to the results of the work in other directions also, brought with him a specially constructed closable net of his own designing so constructed that it could be lowered, closed, opened, raised a given distance, closed again and brought to the surface. One of the nets has already been described (Birge 95, p. 423) and the other will be shortly. At times both of the nets were used together and again a series of hauls was made with one only. The coarser cloth used in the net, the smaller amount of material obtained and the greater rapidity with which a pure crustacean haul filters, made it possible for them to secure a series of hauls from 2 and 5 meters and then every ten meters to the bottom even in the deepest places, in the same time that was consumed in making with the vertical net the series of hauls already described. These hauls are to be counted in the simplified method described by Birge (95), and will make an exceedingly valuable contribution to the vertical distribution of this most important element of fish food contained in the plankton.

SWARMS IN THE PLANKTON.

In the preceding pages an effort has been made to show uniformity of horizontal distribution of the plankton as a whole and the absence of such accumulations as might be termed "swarms." From the evidence obtained here and elsewhere I am led to believe that swarms of the entire plankton do not exist and furthermore I can see no variations of biological conditions which should accumulate *all* the life in the water within certain areas, large or small, and leave other areas more or less devoid of life. Even on the land where conditions are so much more variable that environment in the water is relatively stable, no such local accumulations are found. It is true that areas of considerable extent are more densely populated than other parts of the land, and the jungles of the tropics, for instance, are sometimes said to "swarm" with life. In the same way Agassiz (88) speaks of that portion of the continental slope and of the opposite island slope which is washed by the Gulf Stream as crowded with life. In these and similar instances there is a comparison of considerable areas with distant portions equally large. This is not in the least parallel with what some have believed to be plankton swarms. Investigators have declared that within the narrow limits of small bodies of water and frequently at points proximate to each other the total amount of plankton varies so greatly as to warrant the assumption of contiguous populous and barren areas in the water, that is the existence of swarms of the entire plankton. Now the work of Reighard in Lake St. Clair and Apstein and Zacharias in Holstein lakes and the results of this work on Lake Michigan have shown clearly, in my opinion, that this is not the case. In the preceding pages is given evidence that the total amount of plankton does vary, but that it varies in accord with the depth and that beyond this there are no variations considerable enough to warrant the assumption of the existence of swarms of the plankton as a whole. It would not be strange if the exact amount of plankton varied, perhaps considerably, at the two ends of Lake Michigan and certainly some shallow plant-filled lakes in the vicinity of Charlevoix and in free communication with the main lake by small yet perfectly open channels do contain a much larger amount of plankton than Lake Michigan itself, yet the first possible variation is as little evidence of swarms as the latter.

How do the separate species conduct themselves in this respect? Are they also nearly equally distributed, or is there reason to think that they may occur in swarms? The inequality in seasonal distribution of various species is well known. Thanks to the work of Zacharias a considerable number of species have been watched from day to day and it seems clear that most forms pass through one or more cycles of variation in each year. Such a cycle includes a period of advance, of increase in numbers, a maximum, a time of decline and decrease in numbers, and finally a minimum, or often a period of total disappearance from the plankton. These cycles are coincident with seasons or changes in temperature. Birge (95) has recorded similar variations for species in Lake Mendota. Such variations as these are characteristic of entire bodies of water, or at least very large areas in a body of water. The species appears everywhere almost at once and its disappearance is similarly general. It is not evidence of swarms to record, as Zacharias does (95, p. 120 *ff.*), that a certain species was abundant in one place and wanting on the other side of a long island which almost completely divided the lake into a northern and a southern half. It must first be shown that the conditions which determine the development of the species, temperature, food, etc., are alike in both places, and no evidence on these weighty questions was sought or furnished. But even then it is as little evidence on species swarms as the fact that a certain fish may be caught in plenty here and is lacking there is proof of that that particular fish goes in schools!

The word "swarm" seems to need a more precise definition in the light of conditions known and easily observed. To my mind it is some such massing of individuals as is seen in a school of fish, a flock of birds, a herd of wild cattle. The idea is certainly not precise in quantity since any one of these aggregations may consist of only a few individuals or of many hundreds. They are, however, definite bands collected for breeding or feeding purposes, or for protection, or having been produced by excessive multiplication, they still remained in a localized mass. If this be a correct interpretation of conditions, then neither those accumulations of plankton or single species made at certain points by the chance of wind or current, nor yet these normal variations in the number of any species within a given area due to the more favorable environment, can be properly spoken of as *swarms*.

Recurring to conditions on the land we see that swarms of the entire plankton are not to be expected and in fact the possibility of such may well be doubted. In making only quantitative determinations of the plankton species swarms, if existing, are apt to escape notice or even to be masked by the normal variations in the total amount, by errors in method, apparatus, or manipulation and by the alternation of swarms of different species. Furthermore it is certain that if such swarms do exist there is a constant tendency to destroy them in the action of winds, waves and currents.

A species swarm will affect the total volume of plankton very little, i. e., not noticeably in contrast with other variations, if the species is ordinarily very common, if it is of small size or if it is one of many species (*polytonic* plankton). On the other hand the total volume of the plankton will be considerably affected if the species swarming is of large size, commonly rare, or if the plankton is *monotonic* (composed of but few species). Of course all grades between these two extremes are possible and a considerable factor will be the size of the swarm i. e., the number of individuals of which it is composed.

The evidence heretofore collected as to the existence of species swarms seems to me insufficient. So for instance the enumeration of a certain species taken in a haul from a depth of 40 m. shows at one time 400 individuals, at a second haul 1,100, a considerable increase to be sure, but not such evidence as to establish the occurrence of swarms. If it be true that the species is equally distributed over the entire depth, and the contrary is not even suggested in the context, then every cubic meter held at the time of the first haul 10 individuals, at the second 28. One section of land holds now 10 cattle, later 28; where is the evidence of herds? It is evident that actual proof of the occurrence of swarms demands more exact and detailed evidence than has yet been furnished. We collected no positive evidence upon this point, but one circumstance tends to my mind to establish the probability of the occurrence of swarms under some circumstances. During one of our trips on Lake Michigan the runner net was drawn over a certain area of ground off Fisherman's Island several times. Each haul brought up a good catch of crustacea, but in one there was such a mass of *Limnocalamus* that they formed a solid mass of several ccm. The number was fifty or one hundred times greater than that obtained in the other hauls. That this was the result of including some local aggregation of the species, i. e., some swarm, is the most evident, if not the only explanation of the case. On another day Mr. Jennings reported a mass of *Asplanchna* at the surface just off the lighthouse pier so great that thousands could be taken at every haul of a net thrown from the pier. A few hours later not one was there. This may have been, however, a wind collection or even a current collection. Of course the surface is peculiarly liable to such aggregations by the effect of wind or current and the deeper water more independent of such influences.

PINE LAKE.

The town of Charlevoix is built on a narrow neck of land which separates Lake Michigan from Pine Lake (see map). The circular basin of Round Lake, which affords a fine harbor for the shipping and fishing industries of the place, lies nearly half way between the lakes first named, and is in free and open communication with both by channels of considerable size. The laboratory was located on the shore of Round Lake near the building in use by the Michigan Fish Commission as a hatchery, and the situation naturally caused us, in making the preliminary studies, to turn our attention first to Round Lake and then to Pine Lake and Lake Michigan. In the course of these studies some features of interest were manifested by the comparison of the three bodies of water, and these were supplemented by some special observations on the part of the botanist of the party, Mr. Thompson. From their importance in connection with the general question of fish culture, certain of the biological characteristics deserve brief consideration here.

Round Lake, a scant half mile in diameter, is little more than an enlargement in the course of the stream by which Pine Lake empties into Lake Michigan The connection between these lakes has been modified for commercial use by dredging, so that now a five meter channel, protected externally by piers and a lighthouse (see map), connects Round Lake with Lake Michigan. Between Pine Lake and Round Lake the old stream, which has been entirely replaced by a straight dredged connection, lies at one side, a shallow tortuous brook, known as the "Old Channel." The broad, deep and straight artificial channel renders communication between the lakes very free and a current runs indifferently in either direction, depending upon the direction of the wind, and no doubt also on the level of Lake Michigan and Pine Lake. This results, of course, in more or less of a mixture of the forms of life, especially of those plankton species which occur in the two.

Round Lake is simply intermediate ground, and in the character of its plankton resembles now the one, now the other of the larger lakes so that it possesses no characteristic features in distinction from them. With the docks which line a large part of its shore and the continuous disturbance and pollution of its waters, there is little opportunity for the development of aquatic plant life; yet those portions of the lake which offer any possible foothold are fairly well supplied with water plants, noticeably the shallow banks and the quiet waters of the old channel.

Pine Lake is a body of water in which, as in Lake Michigan, conditions are very stable. The area which drains into it is evidently limited, as a glance at the map will show, and the size of the lake itself is such that the inflow and outflow form but a small percentage of the total volume. There is a current running into the lake at the outlet quite as frequently and quite as powerfully as there is in the opposite direction. The shore is, in large part, sand and gravel for a short distance from the margin, but nearly the whole bottom of the lake is composed of marl, in which one finds a host of shells in good preservation. From washings of the marl, Mr. Walker identified the following forms:

Limnæa desidiosa Say.
catascopium Say.
sp.
Physa integra Hald. (young).
Planorbis bicarinatus Say.
parvus Say.
Valvata tricarinata Say.
sincera Say.
Amnicola porata Say.
lustrica Pils.

Goniobasis livescens Mke.
Sphærium striatinum Lam.
simile Say.
Pisidium abditum Hald.
sp.
Unio luteolus Lam. (dead).
sp. (dead).
Anodonta (young) (dead).
Footiana (?) Lea.

He adds concerning these shells: "A very few of the *Amnicola* and *Valvata* were alive. Everything else was dead and most of it had the chalky appearance of fossil specimens from the marl."

On the marl one finds no living thing save here and there scanty tufts of dwarfed *Chara*, which was never found in fruit; it was uniformly encrusted by a heavy calcareous coating.

The absence of plants along the shore in the shallow water and on the sandy or gravelly bottom is also noteworthy. Isolated patches do occur but they are thrifty and abundant only in a few places, the most prominent of which are on the south arm of the lake. It will be noticed that the axis of the main lake lies directly in the path of the northwest winds and it has occurred to me that this may be the cause of the absence of shore vegetation, since the wash along the shore of a lake as large and deep as this would be too powerful to allow the growth of plants even where the bottom was of a suitable character. In the smaller and more protected south arm there is a much larger amount of vegetation. We were unable to make any exact observations in that part of the lake.

Pine Lake has undoubtedly undergone some considerable modifications within recent geological times. The old outlet to the northward is easily traced through a line of tamarack swamp to Susan Lake; thence to Lake Michigan it follows a small stream which is at present the outlet of Susan Lake. The marl bottom which underlies a very considerable part of Pine Lake can by borings be found not far below the surface at various points around the lake. The gravel and glacial drift are evidently at present being washed out into the lake over the marl and the thickness of the layer decreases gradually as one recedes from the shore. Mollusca are not very abundant and while the species recorded by Mr. Walker are recent and most of them at least found in this locality at present, the existing conditions are inadequate to account for such a bed of marl and I am inclined to believe it the bed of an older lake now gradually disappearing.

The importance of these considerations is evident when we come to examine the fauna and flora of the lake.

I have already mentioned the striking lack of vegetation, both littoral and bottom. Mr. Thompson, who spent some time in a careful examination of the shore says in this connection, "The entire absence of *Myriophyllum*, *Utricularia* and the aquatic species of *Ranunculus* is perhaps significant. The scarcity of plants is apparently due to the marl bottom as all the fairly thrifty plants which do occur are found growing on bottom more or less modified by deposits of sand or alluvial sediment." Similar mention of the limited amount of life discovered in Pine Lake may be found in the reports on the Protozoa (p. 81), Rotifera (p. 88), and Mollusca (p. 98), published in appendices to this paper. Of the insect fauna Dr. Wolcott writes:

"This poverty of the Pine Lake fauna was in marked contrast to the richness of that of the neighboring small inland lakes, in which was to be seen both in respect to number and identity of species and abundance of individuals, a marked similarity to that of Lake St. Clair, indicating the effect of the like conditions, while at the same time it emphasized the contrast between both and Pine Lake."

The plankton studies on Pine Lake discussed on a previous page and plotted on Charts I^B and II^B, show that the surface stratum contains if anything somewhat more plankton than the same portion of Lake Michigan but the deeper strata very much less, so that in shallow water (VIII) the total amount of plankton is approximately the same as in Lake Michigan while in the deeper water (XXVI to VII) the total amount is far below that in the main lake.

After this resumé of other groups it will not be strange that fish are scarce in the waters of Pine lake. Neither those of Lake Michigan nor the species which inhabit the surrounding inland lakes would find any considerable supply of nourishment and in fact a few game fish, in the south arm chiefly, and a few whitefish in the eastern end of the main lake, are all that are reported for this body of water. The absence of a bottom flora and fauna, the scarcity of plankton and the paucity of littoral vegetation with the accompanying forms of life, particularly insect larvæ, are the factors which limit the introduction of various kinds of fish.

I have discussed the conditions here in full since it seems to me a powerful argument for the necessity of employing the experimental method. Such a magnificent lake with miles of shore and acres of beautiful clear water affords possibilities for existence to a multitude of fish. The reasons for their non-existence are apparently clear, and if so the problem is half solved. In some way more vegetation must be made to grow in the lake, perhaps different species of plants introduced. If forms can be found which are capable of growth and increase on a marl bottom, the fish producing power of the lake will be multiplied enormously and in the place of a scanty population the waters will support large numbers of valuable food fish. I have endeavored to ascertain the species of water plants which thrive upon marl bottomed lakes elsewhere, but the question proved to be beyond the facilities at my command. This offers under favorable circumstances a rich field for experimentation.

CONCLUSIONS.

In addition to the more special conclusions stated in connection with various topics there are some general conclusions, especially with reference to the plankton and its bearing on fish culture, which are summarized as follows:

I. The plankton is the source of food supply for all lake fish; its rapid reproduction affords a constant supply in spite of continued destruction.

II. The amount of plankton in Lake Michigan in the region examined is limited. The enormous area compensates for this limited amount.

III. The plankton is uniformly distributed horizontally. At this season of the year it is accumulated near the surface, and very little is contained in water below a depth of 25 meters, except that a second accumulation near the bottom is probably usual. At this season, then, no fish will be found regularly or in numbers in the nearly barren intermediate water below 25 m., except it be in the water near the bottom.

IV. The uniform horizontal distribution of the plankton indicates that the plankton-eating fish find food in limited quantities everywhere.

V. The bottom flora and fauna are not extensive enough to support large numbers of bottom feeding fish within circumscribed areas. The well known migrations of whitefish schools along shore seem thus to be correlated with the non-localized food supply.

VI. There is a plentiful supply of whitefish food on the old fishing grounds. No reason can be assigned for the diminution in the supply of whitefish save overcatching.

In conclusion I should like to emphasize one point which seems to grow clearer as the work proceeds; if the experience of two years has shown anything, it has demonstrated that the possibilities in this line of investigation can hardly be limited, but that future developments which are so essential to the fisherman and the fish culturist alike, are distinctly dependent upon the facilities for carrying on the investigation under permanent conditions.

It may be hoped that something has been accomplished during the two years of this work inaugurated under the auspices of the Michigan Fish Commission and carried on by voluntary and hearty cooperation on the part of various scientific workers. Yet it is evident that progress along this line will be necessarily slow and that at times, as in the present instance, other peremptory duties will encroach upon the time of the workers and delay the publication of the reports. Furthermore, no one can appreciate so well as one who has tried it, how enormous is the mass of work connected with an enterprise inaugurated in a new field of work, and compelled to originate at once methods and appliances with repeated delay and even failure.

It is equally true that the possibilities of future development will be clearest to those who have taken a part in the enterprise. Yet others can not fail to apprehend its importance and the necessity of continuing it. To my mind it is clear that in order to attain its proper results the work must be put on a definite basis. It must be rendered permanent and placed in the immediate charge of workers who shall devote to it their entire time. If any measure of success has accompanied it in the past while it has been under the direction of those whose time was necessarily limited or when perhaps it has been carried out as a side issue in connection with the regular work of some fish hatching station, it is none the less true that it demands and deserves the full attention of able and trained investigators.

There should also be mentioned in this connection the mass of experimental work which must be done. It is of vital importance for the solution of problems which present themselves in connection with the biology of the lakes and their inhabitants, that experimental investigation should be possible in order to test the results, to answer questions, and to suggest possibilities that would otherwise remain undeveloped. No one can have read the preceding pages without having appreciated continually the questions suggested in connection with the most varied topics; no one can fail to see that the results attained should be supplemented or controlled by experiment.

The life of the young white fish, its food and growth while in the state of nature, the best age and place for planting, and hundreds of other questions which suggest themselves in connection with this particular topic cannot be decided in a few weeks work of a summer party however well equipped and located. Questions with reference to the yearly variations in the plankton and those problems suggested in connection with the discussion of these questions early in the report, cannot be solved until a permanent biological station shall be able to observe and to experiment continuously throughout the year. Already efforts have been made on a limited scale at least, towards the increase and multiplication of the food supply of fresh water fish and in some small ponds of Europe it has met with moderate success. The discussion of Pine Lake suggests an equally fertile field of study. The possibilities of the future are evidently dependent upon the possibilities for investigation and experiment. Aquaculture must be given the same sort of scientific treatment that agriculture already receives at the hands of the thousand trained investigators in experiment stations that are located in every state of the Union. It must be studied from the same scientific standpoint; its problems analyzed, its course marked out definitely; not until then can it render that service to the people which the opportunity of our inland seas makes possible in the way of a food supply at once cheap and agreeable. Let me quote from an address before the American Microscopical Society: "Fish culture will never attain its proper results until it receives by the liberality of the State and nation the same favors that have been extended to agriculture, the use of permanent and well equipped experimental stations where trained workers shall devote all their time and energy to the solution of its problems. The Great Lakes furnish a cheap and valuable food supply to one-third of our entire population, This food supply is rapidly becoming depleted. How long must such important interests wait their just recognition and adequate protection? And if properly developed, who can limit the possibilities of these Inland Seas in supplying the nation with food?" The urgent need of the present is not a mere biological observatory, however valuable such a permanent foundation might be, but a well-equipped and well-directed experiment station to attack the peculiar problems of fish culture in the Great Lakes.

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NOTE—Since the earlier pages of this report were in print there has appeared "The Lakes of North America" by I. C. Russell; Ginn & Co., Boston, 1895. This gives (p. 57 to 63) physical data on the Great Lakes more fully and accurately than any authority previously at my command. The figures quoted on pages 8 and 9 of this report should be slightly modified, but the argument and conclusions are in no way affected. Much additional information of interest on the physical features of the lakes may also be found in the work cited.

APPENDIX I.

REPORT ON THE PLANTS.

BY H. D. THOMPSON, MOLINE, ILL.

For the three weeks beginning August 2, 1894, it was the good fortune of the writer to be with the investigating party maintained at Charlevoix by the Michigan State Fish Commission. During this time there was made some study of the minute plant life of Lake Michigan and a botanical survey of Pine Lake was begun. The time did not suffice for the proper handling of either task.

Pine Lake is a marl bottomed basin of a type not rare in northwestern Michigan. Unlike many of the small lakes which line the shore of Lake Michigan, its greatest length, instead of lying parallel with the adjacent shore line of the larger lake, forms with it a large angle. Some fifteen miles long and in its broadest portion three miles wide, and very irregular in outline its shore line exceeds ninety miles. Its western end is rather more than a mile from Lake Michigan with which it communicates freely through Round Lake. The natural water ways from Pine Lake to Round Lake and from the latter to Lake Michigan have been so improved for purposes of navigation by large lake boats, as to render communication much freer now than formerly.

The shore of the lake rises in two bold terraces which appear with much regularity and clearness at Belvedere, and though sometimes broken, in places effaced by erosion, and often lying at considerable distance from the present shore line, they may still be traced along the lake for long distances to the eastward, and are continuous around Round Lake on both sides and thence along Lake Michigan both to the northward and southward.

At present the lake consists of a long, narrow, central basin twenty to twenty-five meters in depth with a uniform regular marl bottom, extending from Charlevoix at its western end to Boyne at the eastern, surrounded by shallower waters including all coves and bays and a marginal area of varying width along the shore.

The bays are all rather shallow, the bottom sloping away gradually from the shore line toward the edge of the basin, which in each case extends across the mouth of the bay in a line between points in front of the headland on either side.

In general the bottom drops off evenly until, at a distance of two hundred twenty-five to three hundred twenty-five meters from shore there is a depth of about fifteen meters; then in course of two or three rapid casts of the lead eighteen to twenty-one meters is found, and the lead comes up bearing soft sticky marl. Exceptions were noted in which the gentle slope was continuous from the shore line, for a full half mile into the lake, before the twenty meter depth was reached. One and one-half miles N. E. of Advance a depth of twelve meters was found at fifty meters from shore; twenty meters, fifteen meters farther out, and within another twenty-five meters the lead dropped down twenty-six meters, to the end of our sounding line, but found no bottom.

The beach of Pine lake varies from sand in certain localities to calcareous gravel or even soft marl in others. The bottom of the shallow marginal portion naturally partakes of the character of the adjacent beach, but invariably shades off to a marl as deeper water is reached. In some bays surrounded by cedar swamps the bottom is of soft, blackish mud, part marl, part alluvial deposit. In a few places where a bold sandy terrace approaches the shore line closely, the bottom is of clean sand for a long distance out toward deep water.

The flora of Pine Lake is exceedingly meager. The observer may row along its shore for miles without seeing one thrifty bed of water weeds, and may dredge back and forth over a hundred acres of bottom without securing a handful of vegetation. In water varying from three to seven meters in depth were found scanty beds of *Chara* sp., never of thrifty well grown plants, never in fruit and always encrusted with calcareous material. Along shore, in water one and one-half to three meters in depth, occur a half dozen thin and rather small beds of *Potamogeton perfoliatus* L. Half way up the lake on the north side, on sand bottom, was a fairly thrifty and good sized bed of *Scirpus pungens*, *Potamogeton perfoliatus* L., *Potamogeton lucidulum*, *Naias flexilis* and *Chara* sp. In the edge of this bed toward deep water several fishing stakes were noticed.

Some bass fishing being reported in Oyster bay on the south side of the lake, it was examined with some care. Oyster bay is an arm of the lake a half mile wide and nearly one and a half miles long. At the mouth the bottom slopes gently away from the shore on either side to a depth of nine meters near the middle. It becomes shallower steadily as its head is approached, ending in a marsh which shades off to the surrounding cedar swamp. Separated from this bay by a stretch of cedar swamp lies Susan Lake. In Oyster bay the bottom is of marl and black sediment mixture previously mentioned and vegetation is more plentiful than we found it elsewhere in the lake. A mile or more of shore line about the head of the bay is fringed with thrifty beds of *Scirpus pungens* Vahl., and *Scirpus lacustris* L.; *Potamogeton perfoliatus* L. occurs in several places. *Acorus calamus* L. and *Typha latifolia* L. also occur here though not noted elsewhere in the lake. The bottom bears numerous and fairly thick beds of *Chara* sp., the same as found elsewhere in the lake. There was everywhere a striking scarcity of algæ and the entire absence of *Myriophyllum*, *Utricularia* and aquatic species of *Ranunculus* is noteworthy.

The examination of material collected by tow net and dredge from the neighboring waters of Lake Michigan, Round Lake and Pine Lake for minute life, which had been in progress for several weeks, was near completion at the time the writer became a member of the Fish Commission party. Material was examined, however, and data collected, sufficient perhaps to indicate certain obvious facts, though not sufficient foundation for any complicated or detailed conclusions.

As might be expected from the free communication between Lake Michigan and the smaller lakes, the three lakes vary little in flora. The open, wind agitated waters, unobstructed by the larger aquatic plants, and for the most part of considerable depth, afford but poor harbor for the filamentous algæ, Desmidiæ and Characeæ so abundant in the waters of Lake St. Clair investigated by the commission in 1893. The tow net and dredge, therefore, collect but little of such material, but the Diatomaceæ are ever present.

Of the algæ *Pandorina morum* Bory., is most frequently met, occurring chiefly in surface tows, sometimes in great abundance. The stray specimens noted in deep tows may have been taken by accident, as the net was lifted from the water. Bottom tows and dredgings in Lake Michigan show fine colonies of *Nostoc commune. Vaucheria tuberosa* also is common clinging to rocks, waterlogged bits of wood, etc., often at considerable depth It occurred in great abundance on fishing grounds off High Island, with *Chara* sp., the dredge teeth soon becoming entangled with bushels of this mixed material. In Pine Lake the surface net not infrequently collected bits of *Spirogyra* sp., *Zygnema* sp., *Oscillaria elegans* Ag., *Lyngbya* sp. The fragments were always quite small, generally so far gone to pieces as to be of doubtful identity and were probably from beach pools washed into the lake by receding waves during high wind.

The Desmidiæ were not represented in any material examined from Lake Michigan, Round Lake or Pine Lake. In a surface tow from Twin Lakes, the following were noted:

Cosmarium brebissonii Menegh.
C. marginatum Menegh.
C. reniforme.
C. subcrenatum Hantzsch.
C. undulatum.
Pediastrum ehrenbergii Corda. (H. Br.).
Sphærozasma filiforme Rab.
Staurastrum corunulatum Wolle.
S. grallatorium Nord.

The Diatomaceæ, greatly outnumbering all other plants both as to species and individuals, force themselves constantly upon the attention of the botanist. Individuals are generally present in much greater numbers in deep than in surface tows, but the distribution of species appears to be influenced but little by depth of water. The stipate forms are of course more often found in the neighborhood of a congenial support, but with little regard to the depth of this support below the water surface. The following species were noted, most of them in great numbers:

Asterionella formosa Hass., common in both surface and deep tows.
Cocconema lanceolatum Ehr., frequent in dredgings.
Coscinodiscus radiatus Ehr., occasional among weeds.
Cyclotella rotula Kütz., in dredgings, infrequent.
Cymbella gastroides Kütz., common in deep and surface tows.
Cystopleura gibba (Ehr.) Kütz., common in surface and deep tows everywhere.
Navicula viridis (Nitzsch.) Kütz., common on weeds in shallow water.

Nitzschia dubia Wm. Sm., single specimen, among weeds near surface.
Nitzschia sigmoidea (Nitzsch.) Wm. Sm., in surface and deep tows.
Epithemia turgida Wm. Sm.
Fragilaria capucina Desm., deep and surface tows, very common.
Gomphonema geminatum (Lyng.) Ag., surface and (more often) deep tows.
Orthosira sp., like *O. Dikii* Wm. Sm., once in surface, once in deep tow.
Stauroneis phœnicenteron Ehr., deep tow.
Synedra affinis Kütz., surface and deep tows.
S. lunaris Ehr., among weeds in shallow water.
S. ulva (Nitzsch.) Ehr., in dredgings.
Tabellaria fenestra (Lyng.) Kütz., common everywhere.
T. flocculosa (Roth.) Kütz., common.

Washings from aquatic plants are, as is well known, generally rich in Diatomaceæ. The following species identified by D. B. Ward, M. D., of Poughkeepsie, N. Y. are from a small vial of material washed from *Chara* sp., previously mentioned as being dredged from the bottom in High Island harbor, Lake Michigan.

Achnanthidium flexellum.
Amphora ovalis.
Campylodiscus novicus.
Cocconeis placentula.
Cocconema cistula.
C. gastroides.
C. lanceolatum.
C. cymbiforme.
Cyclotella compta.
Cymbella ehrenbergii.
Encyonema limula.
E. prostratum.
E. turgidum.
Epithemia argus.
E. gibba.
E. turgida.
Eunotia arcus.
E. diodon.
E. pectinalis.
Fragilaria Harrisonii.
F. capucina.
Gomphonema capitatum.
G. constrictum.
G. coronatum.
G. intricatum, var. *pumilla.*
Melosira granulata.
Navicula affinis.
N. bacillum.
N. limosa.
N. oblonga.
N. nobilis.
N. radiosa.
N. perigrina.
N. trinodis.
N. viridis.
Nitzschia frustulum.
N. palea.
Odontidium hyemale.
Pleurosigma attenuatum.
Surirella bifrons.
S. biseriata.
S. elegans.
Stauroneis gracilis.
S. phœnicenteron.
Stephanodiscus astrea.
Synedraulna, var. *longissima.*
Tabellaria fenestrata.
T. flocculosa.

The writer desires to acknowledge his obligation and express his thanks to D. B. Ward, M. D., of Poughkeepsie, N. Y., for the identification of the above list of diatoms and to Mr. C. F. Wheeler, of Michigan Agricultural College, who has identified a considerable number of flowering plants.

APPENDIX II.

A REPORT UPON THE PROTOZOA OBSERVED IN LAKE MICHIGAN AND THE INLAND LAKES IN THE NEIGHBORHOOD OF CHARLEVOIX, DURING THE SUMMER OF 1894.

BY C. A. KOFOID, SUPERINTENDENT OF THE BIOLOGICAL STATION OF THE UNIVERSITY OF ILLINOIS, URBANA, ILL.

The observations in the following paper were made in the laboratory of the Michigan Fish Commission at Charlevoix from July 24 to September 1, 1894. The material examined consisted in the main of collections made at the surface and bottom, with fine muslin nets, principally in Pine and Round lakes and Lake Michigan. In addition to these, shore collections were made along Round, Pine, Susan, Twenty-six, East and West Twin lakes, either by dragging the Birge net through the weeds along the shore, or by gathering the vegetation—algæ, *Chara*, *Naias*, *Utricularia*, *Potamogeton*, *Myriophyllum*, and *Nuphar*—and keeping it in aquaria in the laboratory, or collecting "washings" from it for immediate examination. To the systematic examination of these shore collections but little time could be given as the plankton was the main object of our investigation.

The present paper makes no pretension to completeness. It is merely a list, a compilation from the daily record of the occurrence and distribution and relative abundance of such species as were identified during the six weeks of my stay at the laboratory. Many of the smaller Flagellata and Ciliata were not identified and no attention was paid to the Gregarinidæ and little to the ecto and endo-parasitic Protozoa of the denizens of the lakes examined. The present report does not include the collections made with the plankton net in Lake Michigan, nor those made by Dr. R. H. Ward with the Birge net in the lakes to the north of Charlevoix as these collections have not yet come into my hands. A continuous and more thorough investigation would undoubtedly greatly extend the list of Protozoa here reported for the locality. A few forms were found which could not be referred to any described species in the literature at hand.

The appended list records 81 forms, 76 species and five varieties. The list reported by Smith (Bulletin Michigan Fish Commission No. 4, 1894), for Lake St. Clair includes 32 forms, eighteen of which are to be found among those observed at Charlevoix.

The forms included in the present list are distributed as follows among the different groups:

Rhizopoda	22
Heliozoa	5
Mastigophora	20
Infusoria	34

RHIZOPODA.

1. *Amœba proteus* Leidy. Swampy shores of Pine Lake, and West Twin Lake. Not common.

2. *Amœba radiosa* Ehrbg. Swampy shores of Pine Lake. Rare.

3. *Amœba verrucosa* Ehrbg. Among the algæ along the shores of Pine Lake. Not common.

4. *Cochliopodium bilimbosum* Auerbach. A single specimen from washings from *Chara* obtained at High Island harbor was observed. The collections came from a depth of about 6 m. on whitefish grounds.

5. *Arcella vulgaris* Ehrbg. Twenty-six Lake, East and West Twin lakes, in shore collections. Occasionally found in the surface and bottom tow in Round Lake. Common in *Sphagnum*.

6. *Hyalosphenia elegans* Leidy. Common in *Sphagnum* along the shores of Pine Lake. Single specimen taken in surface tow at West Twin Lake.

7. *Hyalosphenia papilio* Leidy. Common in *Sphagnum* along shores of Pine Lake.

8. *Quadrula symmetrica* F. E. Schultze. Common in *Sphagnum* along shores of Pine Lake.

9. *Difflugia collaris* Ehrbg. Common among *Fontinalis* from shores of East Twin Lake.

10. *Difflugia constricta* Ehrbg. In shore collections from Twenty-six Lake. Rare.

11. *Difflugia globulosa* Duj. Occasional in shore collections at East and West Twin Lake and Twenty-six Lake; in *Sphagnum* along Pine Lake. Common in surface and bottom tows and hauls of the plankton net in Round and Pine lakes and especially in Lake Michigan. It is much more abundant in surface than in bottom tows and in Lake Michigan than in the smaller lakes. It is very resistant, remaining active long after other animals in the tow have perished because of foul water. The limnetic form cannot be distinguished specifically from the form found in shore collections and in *Sphagnum.*

12. *Difflugia lobostoma* Leidy. Taken in surface tow in West Twin Lake in shallow water; also in bottom tow in Round Lake in 16 m. of water. Rare.

13. *Difflugia pyriformis* Perty. Occasional in shore collections along Pine and Twenty-six Lake; also in bottom tow in Round Lake in 16 m. of water and in bottom tow in Lake Michigan, 2¾ miles from shore in a haul of the plankton net in 57 m. of water.

14. *Nebela barbata* Leidy. Occasional in Sphagnum along Pine Lake. Forms intermediate between *N. barbata* Leidy and *N. collaris* Ehrbg. were also found in the same locality. (See Leidy's Fresh Water Rhizopods of N. A., Pl. 24, Figs. 18, 19.)

15. *Centropyxis aculeata* Stein. In shore collections along Pine Lake, East Twin, Twenty-six, and Susan lakes. Also in bottom tows in Lake

Michigan, 1½ miles off New York Point in 24 m., and 2 miles off Norwood in 16 m. of water. Occasional.

16. *Centropyxis ecornis* Leidy. A single dead shell was found in shore collections from East Twin Lake. This is probably a variety of the preceding.

17. *Euglypha alveolata* Duj. Occasional in shore collections along Pine and West Twin lakes, in *Sphagnum* and washings from *Utricularia*.

18. *Euglypha ciliata* Ehrbg. A single specimen was taken in surface tow off Fisherman's Island, in Lake Michigan. Common in *Sphagnum* about Pine Lake.

19. *Euglypha cristata* Leidy. Rare in *Sphagnum* along shores of Pine Lake.

20. *Trinema enchelys* Ehrbg. Common in *Sphagnum* along the shores of Pine Lake. Occurred also in shore collections from West Twin Lake. A single specimen was noted in a haul of the plankton net in 55 m. of water, 2½ miles off Norwood in Lake Michigan.

21. *Cyphoderia ampulla* Ehrbg. In shore collections from Pine and West Twin lakes. Common, especially in *Sphagnum*. Occasionally found in bottom tows in Round Lake and once in Lake Michigan 2¾ miles from shore in a haul of the plankton net in 57 m. of water.

22. *Gromia mutabilis* Bailey. Common on floating colonies of *Ophrydium versatile* in East Twin Lake.

HELIOZOA.

23. *Vampyrella laterita* Fres. Rare, in shore collections from East Twin Lake and Twenty-six Lake, among algæ or on masses of *Ophrydium versatile*.

24. *Actinophrys sol* Ehrbg. Lake Michigan, Pine Lake, Round Lake, West Twin Lake. More abundant in surface than in bottom tows. Found also in shore collections. Common.

25. *Actinosphærium Eichhornii* Ehrbg. Bottom tow in Round Lake, also in bottom tow in Lake Michigan, N. W. of Norwood, two miles from shore in 15 m. of water. Rare.

26. *Heterophrys myriapoda* Archer. Rare among algæ in pools along Pine Lake.

27. *Rhaphidiophrys viridis* Archer. In shore collections from East and West Twin and Susan lakes. Rare.

MASTIGOPHORA.

28. *Dinobryon sertularia* Ehrbg. The type as figured and described by Bütschli and Kent, is much less common than the varieties. It occurs however in surface and bottom tows in Round Lake and Pine Lake and in Lake Michigan, and in shore collections at West Twin Lake.

29. *Dinobryon sertularia* Ehrbg. var. *angulatum* Seligo. Most common of all varieties, occurring in surface and bottom tows in West Twin, Round, and Pine lakes and Lake Michigan.

30. *Dinobryon sertularia* Ehrbg. var. *divergens* Imhof. Very common in surface and bottom tows in Round and Pine lakes, and in Lake Michigan.

31. *Dinobryon sertularia* Ehrbg. var. *undulatum* Seligo. Common in Round and Pine lakes and in Lake Michigan in surface and bottom tows.

32. *Dinobryon stipitatum* Stein. Common in surface and bottom tows in Round and Pine lakes, most abundant in Lake Michigan. Intermediate forms connect this with the preceding species, and it should perhaps be reduced to a variety.

33 *Uroglena volvox* Ehrbg. Common in surface and bottom tows in Round and Pine lakes and in Lake Michigan.

34. *Euglena viridis* Ehrbg. Common in shore collections along Pine, East Twin and Twenty-six lakes. Also found occasionally in bottom tow in Pine Lake at a depth of 15 m.

35. *Entosiphon sulcatum* Stein. Among algæ in pools along the shore of Pine Lake; common.

36. *Synura uvella* Ehrbg. Occasional in surface and bottom tows in Round and Pine lakes and in Lake Michigan.

37. *Mallomonas acaroides* Zach. In surface tow in shallow water in West Twin Lake; also in bottom tow in Pine Lake in 13 m. of water; occurring in both cases with the following variety; rare.

38. *Mallomonas acaroides* Zach., var. *producta* Zach. Common in bottom tows from Pine Lake, Aug. 4, but not found again during the summer except in small numbers in surface tow at West Twin Lake on Aug 6. Cysts were forming Aug. 4, and no individuals intermediate between the type and the variety were noticed in the material examined.

39. *Gonium pectorale* Ehrbg. Occasional in bottom tow in Pine Lake.

40. *Pandorina morum* Ehrbg. Occasional in surface tows in Lake Michigan.

41. *Volvox globator* Ehrbg. Rare in bottom tow in Round Lake.

42. *Diplosiga frequentissima* Zach. Common in surface and bottom tows in Round and Pine lakes and Lake Michigan on *Asterionella.*

43. *Chilomonas paramœcium* Ehrbg. Very abundant in shore collections which had stood in laboratory for several days. *Paramœcium aurelia* had been abundant in the same jars on previous day but decreased rapidly in numbers as *Chilomonas* multiplied.

44. *Peridinium tabulatum* Ehrbg. Frequent in surface tows in Lake Michigan, also in surface tow in West Twin Lake, and surface and bottom tows in Round Lake. Taken in small numbers with the Birge net in Susan Lake.

45. *Ceratium cornutum* Ehrbg. Frequent in washings from *Utricularia* from West Twin Lake; associated with a long slender form of *C. hirundinella* O. F. Müll. with divergent horns.

46. *Ceratium hirundinella* O. F. Müll. In shore collections from Pine, Round, Susan, East and West Twin lakes, occasional. Abundant in every surface and bottom tow in Round and Pine lakes, and especially in Lake Michigan. Triangular cysts were common in bottom tows and dredge washings during the first two weeks of August. They were also found occasionally in surface tows. A wide range of variation is exhibited by this species. The horns vary in number from three to six, also in the degree of their prolongation and divergence. Individuals with deformed, curved and even hooked horns were found. One three horned specimen had the left posterior horn bifid for about half its length.

47. *Glenodinium cinctum* Ehrbg. Common in shore collections along West Twin Lake especially in washings from *Utricularia.* Also found in surface and bottom tows in Lake Michigan, and in the latter part of August the gelatinous "cysts" containing one to three individuals were

common in surface and bottom tows in Round and Pine lakes and in Lake Michigan.

INFUSORIA.

48. *Coleps hirtus* Ehrbg. In shore collections from East and West Twin lakes. Frequent especially in aquaria that had stood for some days.

49. *Trachelius ovum* Ehrbg. A single specimen observed from pool along Pine Lake.

50. *Dileptus anser* O. F. Müll. In shore collections (Birge net) in West Twin and Susan lakes. Occasional.

51. *Nassula ornata* Ehrbg. Common on colonies of *Nostoc* and Diatoms and on Phryganeid egg masses brought up in the trawl off Beaver Island in Lake Michigan from a depth of 60 m.

52. *Frontonia acuminata* Ehrbg. Rare in shore collections at East Twin Lake, associated with *Ophrydium versatile.*

53. *Uronema marina* Duj. Very common in algæ in pools along Pine Lake.

54. *Paramœcium aurelia* O. F. Müll. Very abundant in shore collections from Pine Lake that stood in the laboratory several days.

55. *Paramœcium bursaria* Ehrbg. In washings from West Twin Lake; rare. Also taken with the Birge net in Susan Lake.

56 *Urocentrum turbo* O. F. Müll. Abundant in shore collections from West Twin Lake that had been standing in the laboratory for several weeks.

57. *Cyclidium glaucoma* Ehrbg. Among algæ in pools along the shore of Pine Lake; common.

58. *Conchophthirus anodontæ* Ehrbg. On *Anodonta, Unio* and *Limnea stagnalis.*

59. *Spirostomum ambiguum* Ehrbg. Among algæ in pools along Pine Lake, occasional.

60. *Stentor igneus* Ehrbg. Abundant in Round Lake upon *Chara.*

61. *Stentor igneus* Ehrbg. var. *fuliginosus* Forbes. Very abundant blackening the margins of the pools along the shore of Pine Lake, also in Round Lake upon *Chara.* Varies greatly in size and amount of black pigment.

62. *Stentor Rœselii* Ehrbg. Rare in shore collections in East and West Twin, Susan and Round lakes.

63. *Halteria grandinella* O. F. Müll. Common among algæ in pools along Pine Lake.

64. *Strombidium turbo* C. & L. Common in shore collections from West Twin Lake that had been standing in the laboratory for several weeks.

65. *Tintinidium fluviatile* Stein. A single specimen in bottom tow from Round Lake, made in 16 m. of water.

66. *Codonella cratera* Leidy. Surface and bottom tows, Pine Lake, and especially in Lake Michigan. Frequent. This species shows a wide range of variation in size, in the relative size of the aperture and the length of the neck. The number of rings on the neck varies from one to five, though in many cases no ring at all can be detected. Many individuals show no traces of the overarching ring about the aperture of the shell.

67. *Stichotricha cornuta* C. & L. Single specimen noted in shore collections from East Twin Lake.

68. *Oxytricha æruginosa* Wrz. Among algæ in pools along Pine Lake; occasional.

69. *Stylonychia mytilus* Ehrbg. Common in shore collections from East Twin Lake.

70. *Euplotes Charon* Ehrbg. Occasional among algæ in pools along Pine Lake.

71. *Aspidisca costata* Duj. Among algæ along shores of Pine Lake. Common.

72. *Trichodina pediculus* Ehrbg. On *Hydra*. This species has been reported by Zacharias (See Zeitschrift für Fischerei und deren Hilfswissenschaften, 1894, Heft 4) as parasitic on young whitefish, as many as 25 individuals being found on 4 sq. mm. of epidermis.

73. *Vorticella rhabdostyloides* D. S. Kellicott. Abundant on floating masses of *Anabæna* in surface and bottom tows in Round and Pine lakes and Lake Michigan.

74. *Vorticella campanula* Ehrbg. In shore collections from East and West Twin lakes; rare.

75. *Vorticella nebulifera* Ehrbg. Occasional in shore collections from Twenty-six Lake.

76. *Ophrydium versatile* O. F. Müll. In East Twin and Susan lakes. Common. Colonies reaching in some cases 125 mm. in longest diameter.

77. *Cothurnia crystallina* Ehrbg. On *Spirogyra* in East Twin Lake, occasional. A single small detached form taken in the plankton net within 3 m. of the surface is probably to be referred to this species.

78. *Lagenophrys ampulla* Stein. On the branchial appendages of *Hyalella dentata* Smith, from West Twin Lake; common.

79. *Stylohedra lenticula* D. S. Kellicott. Common on the caudal setæ of *Hyalella dentata* Smith, from Twenty-six Lake and bottom tows in Lake Michigan.

80. *Dendrocometes paradoxus* Stein. One detached dead specimen was found in the shore collections from West Twin Lake.

81. *Podophrya cyclopum* C. & L. On carapace of *Epischura lacustris* Forbes.

The nature of the lakes examined by the Fish Commission party in 1894 differs strikingly from that of Lake St. Clair examined in 1893. Lake St. Clair is a shallow lake with strong currents and an abundant supply of vegetation. Lake Michigan on the other hand has deeper water, feebler currents and little or no vegetation along its shores or on its bottom. Thus of Magnin's plant zones, the *Phragmitetum*, *Scirpetum*, *Potamogetonetum* and *Characetum* the last only is represented and that too in very limited areas, at least in the parts of the lake examined in 1894. This fact necessarily profoundly influences the character of the Protozoan fauna of the littoral zone and to a slight degree at least the qualitative character of the plankton itself, as it must reduce the number of occasional migrants from the littoral zone.

The conditions in Pine Lake resemble those of Lake Michigan in the absence of littoral vegetation and the limited area of the *Characetum*. Its fine marl and sand bottom affords no support to the alluvium loving water plants. Round Lake also is devoid of any considerable amount of vegetation; only a few scattered *Potamogetons* and isolated patches of *Chara* being found.

The Protozoan fauna of these lakes falls into two divisions representing (1) limnetic fauna—found free swimming or floating in the plankton and including relatively a very small number of species—and (2) littoral fauna.

LIMNETIC FORMS, (21.)

Difflugia globulosa.
Actinophrys sol.
Actinosphærium Eichhornii.
Dinobryon sertularia.
Dinobryon sertularia var. *divergens.*
Dinobryon sertularia var. *angulatum.*
Dinobryon sertularia var. *undulatum.*
Dinobryon stipitatum.
Uroglena volvox.
Synura uvella.
Mallomonas acaroides.
Mallomonas acaroides var. *producta.*
Gonium pectorale.
Pandorina morum.
Diplosiga frequentissima.
Peridinium tabulatum.
Ceratium hirundinella.
Glenodinium cinctum.
Codonella cratera.
Vorticella rhabdostyloides.
Podophrya cyclopum.

Of the 21 species included in the above list all belong to the active limnetic groups except the following which must be classed as passive limnetic forms:

Diplosiga frequentissima (on *Asterionella*).
Vorticella rhabdostyloides (on *Anabæna*).
Podophrya cyclopum (on *Epischura lacustris*).

There is not the least doubt that *Difflugia globulosa* is a prominent and during the period of observation, July 24–Sept. 1, constant member of the limnetic fauna. Its classification as an active form is perhaps questionable. With the exception of this Rhizopod, *Difflugia*, the Heliozoans *Actinophrys* and *Actinosphærium*, and the aberrant ciliate *Codonella*, all of the active limnetic species belong to the Mastigophora, are independent of a substratum for attachment and have holozoic nutrition. They share with the few pelagic algæ and diatoms the important function of furnishing food for the limnetic Crustacea which in turn are probably eaten by fish. They are thus an indispensable factor in the economy of the organic life of the Lakes.

In addition to the species in the above list which form the greater part of the Protozoan plankton there are many species of the littoral zone which are from time to time found in the plankton.

The following forms which probably belong to the littoral fauna have been observed in the plankton and further investigation would doubtless extend the list to include most if not all of the species of the littoral fauna.

Arcella vulgaris
Hyalosphenia elegans
Difflugia lobostoma
Centropyxis aculeata
Euglypha ciliata.
Trinema enchelys
Cyphoderia ampulla
Euglena viridis
Volvox globator
Cothurnia crystallina

Actinosphærium Eichhornii and *Podophrya cyclopum* are also found in the littoral zone and might be included in the list as frequent migrants. *Actinophrys sol* on the other hand must be regarded as a limnetic as well as a littoral species inasmuch as mere migration is insufficent to explain its frequent and repeated occurrence in the waters of Lake Michigan miles from shore.

There is not sufficient evidence at hand for a distinction between the autolimnetic or surface, and the bathylimnetic or abyssal species inasmuch as the nets used for taking the bottom tow were not self closing and so called "bottom tow" included not only the bottom species but also those captured during the ascent of the net. The examination of the hauls with the plankton net will doubtless shed some light on the subject of the distribution of the protozoa in the bottom, the intermediate and the surface zones. So far as the evidence at hand goes, the indications are that the large majority of the limnetic species are found at both surface and bottom. *Difflugia globulosa* and *Actinophrys sol* are apparently more abundant in the surface tow. *Actinosphærium Eichhornii*, *Euglena viridis*, *Mallomonas acaroides* var. *producta*, *Volvox globator*, have been found mainly or only in bottom tows though all but one of these may be migrants, and all occur infrequently.

LITTORAL FORMS.

Lake Michigan has properly speaking no littoral zone. The sandy beach and the action of the waves prevent its formation and the migrants are probably carried down by the tributaries. In the case of Pine Lake however we can distinguish a slightly developed littoral zone with two distinct regions. (1) Shore pools; shallow bodies of water of small extent fed by springs. They contain a few dwarfed rushes, sedges and *Utricularias* and generally an abundance of algæ. In these pools the following species were found:

Amœba radiosa.
Amœba verrucosa.
Arcella vulgaris.
Actinophrys sol.
Vampyrella laterita.
Heterophrys myriapoda.
Entosiphon sulcatum.
Coleps hirtus.
Trachelius ovum.
Uronema marina.
Paramœcium aurelia.
Cyclidium glaucoma.
Spirostomum ambiguum.
Stentor igneus.
Stentor igneus var. *fuliginosus.*
Stentor Roeselii.
Halteria grandinella.
Oxytricha æruginosa.
Stylonychia mytilus.
Euplotes Charon.
Aspidisca costata.

(2.) Sphagnum: This is abundant in the cedar swamps (on the borders of Pine Lake) which are drained by brooks directly into the lake. In some places the *Sphagnum* comes to the water edge. Its Protozoan fauna consists mainly of Rhizopods. The following species were noted. Others doubtless occur.

Amœba proteus.
Amœba radiosa.
Arcella vulgaris.
Hyalosphenia elegans.
Hyalosphenia papilio.
Quadrula symmetrica.
Difflugia collaris.
Difflugia pyriformis.
Centropyxis aculeata.
Nebela barbata.
Euglypha alveolata.
Euglypha ciliata.
Euglypha cristata.
Trinema enchelys.
Cyphoderia ampulla.

The other inland lakes investigated had well developed littoral zones, abounding in plant life. The determination of the fauna of these lakes was confined to the examination of shore collections and this owing to the short time available for the purpose was necessarily very incomplete. Nevertheless it was here that the greatest number of species was found. The following were identified:

Amœba proteus.
Arcella vulgaris.
Hyalosphenia elegans.
Difflugia collaris.
Difflugia constricta.
Difflugia globulosa.
Difflugia lobostoma.
Difflugia pyriformis.
Centropyxis aculeata.
Centropyxis ecornis.
Trinema alveolata.
Cyphoderia ampulla.
Gromia mutabilis.
Actinophrys sol.
Vampyrella laterita.
Raphidiophrys viridis.
Dinobryon sertularia.
Dinobryon sertularia var. angulatum.
Synura uvella.
Mallomonas acaroides.
Mallomonas acaroides var. producta.
Chilomonas paramœcium.
Peridinium tabulatum.
Ceratium cornutum.
Ceratium hirundinella.
Glenodinium cinctum.
Coleps hirtus.
Dileptus anser.
Frontonia acuminata.
Paramœcium aurelia.
Paramœcium bursaria.
Urocentrum turbo.
Stentor Roeselii.
Strombidium turbo.
Stylonychia mytilus.
Stichotricha cornuta.
Trichodina pediculus.
Vorticella campanula.
Vorticella nebulifera.
Ophrydium versatile.
Cothurnia crystallina.
Lagenophrys ampulla.
Stylohedra lenticula.
Dendrocometes paradoxus.

The close similarity of the European and the North American Protozoan fauna is strikingly illustrated in the list of Protozoa observed at Charlevoix. Of the 81 forms identified at least 73 (and probably more) are also found in Europe.

Zacharias in the Forschungsberichte aus der Biologischen Station zu Plön, Theil II, lists 93 Protozoa as occurring in the Plöner See, 43 of which are contained in the present incomplete Charlevoix list. With two exceptions, *Podophrya cyclopum* and *Glenodinium cinctum*, every one of the limnetic species reported for our waters is also found at Plön. The limnetic Protozoa of the two continents are practically identical.

APPENDIX III.

REPORT ON THE ROTATORIA.

WITH DESCRIPTION OF A NEW SPECIES.

BY H. S. JENNINGS.

The Rotatoria are much less abundant in Lake Michigan and the waters connected with it, in the region of Charlevoix, than in Lake St. Clair. The limnetic species are fairly well represented, but littoral and bottom forms are rare on account of the character of the shores and bottom. These are almost everywhere of sand or clay and nearly without vegetation. The number of species found in these lakes is therefore scarcely more than half the number found in Lake St. Clair in the summer of 1893.

In some of the smaller lakes at some distance from Lake Michigan and not openly communicating with it, Rotifera are more abundant, the fauna here showing much more the characteristics of that of Lake St. Clair. The rotifers from these lakes will be reported separately, as will also a short list from the sphagnum swamps of the region.

The account therefore takes the following form:

1. List of Rotatoria from Lake Michigan and the two lakes in open communication with it (Round Lake and Pine Lake), with notes on distribution.
2. List of Rotatoria from pools on the sandy shore of Pine Lake.
3. List of Rotatoria from West Twin Lake.
4. List of some Rotatoria in material brought from Susan Lake.
5. List of Rotatoria from sphagnum swamps near Pine Lake.
6. List of species new to the fauna of Michigan.
7. Systematic and faunistic notes on certain species in the preceding lists, with description and figures of *Distyla signifera* n. sp.

1. LIST OF ROTATORIA FROM LAKE MICHIGAN, ROUND LAKE, AND PINE LAKE.

This list includes limnetic, littoral and bottom species from these three lakes and from the channels connecting them. The three lakes are included in one list on account of their open communication with each other and their similar characteristics; differences will be discussed in the notes at the end. The list does not include forms found in the shallow pools on the shores of Pine Lake, unconnected or only slightly connected with the main waters. These show a different character and are given in a separate list.

In order to show any differences in the fauna of the three lakes included in this one list, a letter is added in parenthesis, indicating in which lake or lakes the form was found. *M.* signifies Lake Michigan; *R.* signifies Round Lake; *P.* Pine Lake, and *C.* the natural channel connecting Round and Pine lakes. (See Pl. IV.)

The figures in parenthesis after the names of certain species refer to the systematic and faunistic notes at the end of the paper.

Rotatoria from Lake Michigan, Round Lake, Pine Lake, and the Channel Connecting Round Lake and Pine Lake.

Floscularia mutabilis Bolton. (M. R. P.)
Floscularia pelagica Rousselet. (M. R. P.)
Conochilus unicornis Rousselet. (M. R.)
Philodina roseola Ehrbg. (C.)
Philodina megalotrocha Ehrbg. (P. C.)
Philodina macrostyla Ehrbg. (M.)
Rotifer vulgaris Schrank. (P. C.)
Rotifer elongatus Weber. (M.)
Callidina musculosa Milne. (M.)
Asplanchna priodonta Gosse. (M. R. P. C.)
Asplanchna Herrickii de Guerne. (M. R. P.)
Asplanchnopus myrmeleo Ehrbg. (P.)
Ascomorpha ecaudis Perty. (M. R. P.)
Anapus ovalis Bergendal. (M. R. P.)
Synchæta stylata Wierz. (M. R. P.)
Polyarthra platyptera Ehrbg. (M. R. P.)
Notops pygmæus Calman. (M. R. P.)
Ploesoma lynceus Ehrbg. (M. R. P.)
Ploesoma Hudsoni Imhof. (M. R.)
Taphrocampa annulosa Gosse. (C.)
Notommata lacinulata Ehrbg. (R. C.)
Notommata monopus Jennings. (M. R. P.)
Copeus labiatus Gosse. (P.)
Proales laurentinus Jennings. (C.) (Note 2.)
Furcularia forificula Ehrbg. (P. C.)
Furcularia longiseta Ehrbg. (P. C.)
Triophthalmus dorsualis Ehrbg. (R. P.)
Eosphora aurita Ehrbg. (R.)
Diglena grandis Ehrbg, (C.)
Diglena forcipata Ehrbg. (C.)
Diglena catellina Ehrbg. (R. C.)
Mastigocerca carinata Ehrbg. (M. P.)
Mastigocerca bicornis Ehrbg. (M. R. P.)
Rattulus sulcatus Jennings. (C.)
Cœlopus porcellus Gosse. (C.)
Cœlopus tenuior Gosse. (C.)
Dinocharis pocillum Ehrbg. (R.)
Dinocharis tetractis Ehrbg. (M. C.)
Polychætus subquadratus Perty. (C.)
Polychætus Collinsii Gosse. (C.)
Scaridium longicaudatum Ehrbg. (P. C.)
Diaschiza semiaperta Gosse. (R. P. C.)
Euchlanis lyra Hudson. (R.)
Euchlanis deflexa Gosse. (C.)
Euchlanis oropha Gosse. (R. P. C.)
Cathypna luna Ehrbg. (C.)
Monostyla bulla Gosse. (C.)
Monostyla lunaris Ehrbg. (R. C.) (Note 6.)
Monostyla closterocerca Schmarda? (M. R. C.)
Metopidia lepadella Ehrbg. (C.)
Metopidia acuminata Ehrbg. (R.)
Metopidia Ehrenbergii Perty. (C.)
Brachionus Bakeri Ehrbg. (C.)
Anuræa aculeata Ehrbg. (M.)
Anuræa cochlearis Gosse. (M. R. P.)
Nothocla scapha Gosse. (M. R.)
Notholca foliacea Ehrbg. (R.)
Notholca longispina Kellicott. (M. R. P.)

Thus in these three connected lakes but fifty-eight species were found, as against one hundred and ten in Lake St. Clair during the preceding summer, though the investigation here was fully as thorough as that of Lake St. Clair. Twenty-four species were found in Lake Michigan, twenty-eight in Round Lake, twenty-five in Pine Lake, and twenty-nine in the shallow channel between Round Lake and Pine Lake. Lake Michigan has four species not found in the others, Round Lake five, Pine Lake two and the channel sixteen.

The great reduction in number comes especially in the littoral and bottom forms. The shores and bottom of Round Lake and Pine Lake were carefully examined, but the number of littoral or bottom forms is only twenty-three. The small number is due to the general absence of vegetation. The few *Chara* beds of Pine Lake harbor very few rotifers. The channel connecting Round Lake and Pine Lake is shallow and contains considerable vegetation, so that a comparatively large number—twenty-nine—of distinctively littoral rotifers were found here.

In Lake Michigan almost no littoral or bottom forms were found. In a few cases vegetation from deep parts of the bottom was brought up by the dredges; in this eight bottom forms were found. These are *Philodina macrostyla* Ehrbg., *Rotifer elongatus* Weber, *Callidina musculosa* Milne, and *Dinocharis tetractius* Ehrbg., dredged from a depth of sixteen meters, and *Ascomorpha ecaudis* Perty, *Mastigocerca carinata* Ehrbg., *Mastigocerca bicornis* Erhbg., and *Monostyla closterocerca* Schmarda, depth not recorded.

The limnetic forms of the list are as follows:

Floscularia mutabilis Bolton.
Floscularia pelagica Rousselet.
Conochilus unicornis Rousselet.
Asplanchna priodonta Gosse.
Asplanchna Herrickii de Guerne.
Anapus ovalis Bergendal.
Synchæta stylata Wierz.
Polyarthra platyptera Ehrbg.
Plœsoma lynceus Ehrbg.
Plœsoma Hudsoni Imhof.
Notops pygmæus Calman.
Notommata monopus Jennings.
Anuræa cochlearis Gosse.
Notholca longispina Kellicott.

Mastigocerca bicornis Ehrbg. was taken several times in the towings, and as has been noted by other observers, seems to be a transitional form between limnetic and littoral Rotatoria. Isolated specimens of some few other rotifers—*Euchlanis oropha* Gosse, *Ascomorpha ecaudis* Perty, *Monostyla closterocerca* Schmarda, *Monostyla lunaris* Ehrbg., and *Notholca scapha* Gosse—were taken occasionally in the towings, but these were evidently wanderers from the bottom or shore.

The list then contains but fourteen limnetic Rotatoria, as against twenty-four from Lake St. Clair. With farther observation I am inclined to believe that a number of those in the Lake St. Clair list are due to the shallowness and rank vegetation of that lake. As such, and as therefore not entitled to be called genuine limnetic forms, I should consider *Apsilus lentiformis* Metsch., *Ascomorpha hyalina* Kellicott, and *Mastigocerca capucina* Wierz. and Zach.

As to the relative abundance of the different species, there is a general, though not exact, agreement with Lake St. Clair. Exact records of the presence of the forms in forty-nine towings taken at different times or places showed the relative frequency of the more common species as follows: *Anuræa cochlearis* Gosse occurred forty two times; *Notholca longispina* Kellicott, forty-one times; *Notops pygmæus* Calman, thirty-eight times. These three commonest species were followed at some distance by *Synchæta stylata* Wierz., twenty-eight times; *Plœsoma lynceus* Ehrbg., twenty-six times; *Polyarthra platyptera* Ehrbg., twenty-four times; *Asplanchna priodonta* Gosse, twenty-two times; *Floscularia mutabilis* Bolton, twenty-one times; *Conochilus unicornis* Rousselet, twenty-one times, and *Notommata monopus* Jennings, seventeen times. The others occurred in less than one-third the whole number of towings. As noted below, in the latter part of the summer *Asplanchna Herrickii* de Guerne became very abundant, forming by far the largest number of individuals in the towings during the last weeks of August.

The limnetic rotifers were considerably less abundant in Pine Lake than in the other two lakes. Thus the average number of species occurring in the surface towings from Lake Michigan and from Round Lake was between nine and ten while from Pine Lake the average was but five and a half. In the bottom towings the average for Lake Michigan and Round Lake was five and a half, while for Pine Lake it was four and a half. Some species were not found at all in Pine Lake; this is true of *Conochilus unicornis* Rousselet, which was very common in the other two lakes; also of *Plœsoma Hudsoni* Imh. *Floscularia pelagica* Rousselet occurred but once from Pine Lake; *Plœsoma lynceus* Ehrbg., twice, *Synchœta stylata* Wierz. (very abundant in the other lakes), three times.

During the daylight the limnetic Rotifera are found in much greater numbers near the surface than near the bottom, reversing the condition commonly observed for the Crustacea. This fact is brought out distinctly in the record of towings. In eighteen recorded surface towings from Lake Michigan and Round Lake, taken on different days, the average number of species present was between nine and ten, and the number of individuals of many of these was very great. In twenty recorded towings from near the bottom of the same lakes, the average number of species found was between five and six, and generally but scattered individuals of each species were found—such as might have been caught in pulling the net to the surface. The difference in Pine Lake is not so considerable, since the number of species found there is very small, either at surface or bottom.

At night the distribution seems not to be materially changed. The immense numbers of Crustacea then present near the surface obscure the Rotifera; but no greater number of rotifers was found near the bottom, in the few towings made at night than in the daytime.

My observations tend most distinctly to show that there is great variation in the numbers of rotifers present in any one region within short periods of time; also that there is great variation in the numbers taken in different regions at about the same time. Certain forms seem fairly constant as to their presence in the towings, from the records given above, but these in some of the towings were present in immense numbers, while in other cases only scattered individuals were found. Other species were at one time present in large numbers, at other times entirely lacking, and this within short periods. This fact of great variations in the number and presence of rotifers is so apparent from the towing records that it is difficult to select any special examples. I will record one striking case of variation within twenty-four hours.

Aug. 22, at 2.30 p. m., I towed along the pier projecting into Lake Michigan from the entrance to the harbor of Charlevoix. The towings were made the full length of the pier four times. The material thus obtained contained immense quantities of *Asplanchna Herrickii* de Guerne. Careful examination of the preserved material led to the estimate that about one-fourth of the entire catch consisted of this form.

The next day at 10:30 a. m., I repeated the towings in the same place and with a similar net. The material collected was found to contain very few *Asplanchnas*. Thinking this might be due to some difference in the two nets, I took the same net used the day before, and at the same time of day, 2:30 p. m., I towed along the pier in exactly the same place and in the same way I had done the previous day. Towings were obtained in quantity similar to those of the day before, but they contained almost no specimens of *Asplanchna Herrickii;* after long examination I succeeded in finding a single specimen.

The two days were similar, both bright, with a slight wind, a little stronger on the second day. The direction of the slight current into the harbor was the same both days.

As to variations with the season, only one marked case came under my observation. In June and July, *Asplanchna priodonta* Gosse was one of the commonest limnetic rotifers, while *Asplanchna Herrickii* de Guerne was scarcely ever observed. But in the early part of August the numbers of *Asplanchna Herrickii* greatly increased, so that for a few days about equal numbers of the two species were found. Then the numbers of *Asplanchna priodonta* began to decrease very rapidly while the numbers of the other species continued to increase. In the latter part of August *Asplanchna Herrickii* was by far the most abundant rotifer in the towings, while *Asplanchna priodonta* had almost disappeared.

2. LIST OF ROTATORIA FROM POOLS ON THE SANDY SHORE OF PINE LAKE.

The shore of Pine Lake is in certain parts low, flat and sandy, with numerous very shallow pools, containing a thick growth of the finer algæ, and sometimes of *Utricularia*. Some of these pools are formed by the spreading out of rivulets flowing into the lake; in this case they are generally connected with the lake itself by narrow, shallow streamlets running a short distance over the sand, and containing no vegetation. Other pools are not under ordinary circumstances connected with the lake at all, but lie at the same level as its waters, separated from it by strips of sandy shore. These pools show a fauna differing in character from anything found in the main body of the lake, and a list of the twenty-seven species found is therefore given separately. Eleven of these species were found also in the waters connected with the main body of the three lakes; the rest were not:

Rotatoria from the Pools on the Shore of Pine Lake.

Philodina megalotrocha Ehrbg.
Philodina macrostyla Ehrbg.
Rotifer vulgaris Ehrbg.
Rotifer tardus Ehrbg.
Rotifer trisecatus Weber.
Microcodides orbiculodiscus Thorpe.
Copeus labiatus Gosse.
Furcularia forficula Ehrbg.
Furcularia gracilis Ehrbg.
Furcularia longiseta Ehrbg.
Furcularia micropus Gosse.
Furcularia semisetifera Glasscott.
Mastigocerca bicornis Ehrbg.
Rattulus sulcatus Jennings. (Note 2.)
Dinocharis tetractis Ehrbg.
Polychætus Collinsii Gosse.
Scaridium longicaudatum Ehrbg.
Euchlanis deflexa Gosse.
Euchlanis triquetra Ehrbg.
Monostyla cornuta Ehrbg.
Monostyla bulla Gosse.
Monostyla closterocerca Schmarda (?).
Metopidia lepadella Ehrbg.
Metopidia Ehrenbergii Perty.
Pterodina patina Ehrbg.
Pterodina reflexa Gosse.
Noteus quadricornis Ehrbg.

3. LIST OF ROTATORIA FROM WEST TWIN LAKE.

West Twin Lake is a small inland lake lying at a distance of several miles from the other lakes examined, and connected with Pine Lake only by a small stream. It differs markedly in its main characteristics from the waters directly connected with Lake Michigan. The shores and bottom are of soft deep mud, and vegetation is abundant. Here the rotatorial fauna is much more like that of the shallow parts of Lake St. Clair than was found elsewhere in this region. From this lake the following species were identified.

Rotatoria from West Twin Lake.

Floscularia companulata Dobie.
Floscularia mutabilis Bolton.
Stephanoceros Eichhornii Ehrbg.
Oecistes mucicola Kellicott.
Lacinularia socialis Ehrbg.
Conochilus volvox Ehrbg.
Philodina macrostyla Ehrbg.
Microcodon clavus Ehrbg.
Asplanchnopus myrmeleo Ehrbg.
Ascomorpha hyalina Kellicott.
Anapus ovalis Bergendal.
Synchæta stylata Wierz. (Note 1.)
Polyarthra platyptera Ehrbg.
Notops pygmæus Calman.
Plœsoma lynceus Ehrbg.
Notommata lacinulata Ehrbg.
Notommata monopus Jennings.
Proales laurentinus Jennings. (Note 2.)
Furcularia longiseta Ehrbg.
Diglena grandis Ehrbg.
Mastigocerca bicristata Gosse. (Note 3.)
Mastigocerca capucina Wierz. u. Zach.
Mastigocerca lata Jennings.
Rattulus sulcatus Jennings. (Note 4.)
Dinocharis tetractis Ehrbg.
Euchlanis triquetra Ehrbg.
Euchlanis oropha Gosse.
Cathypna luna Ehrbg.
Distyla signifera n. sp. (Note 5.)
Monostyla bulla Gosse.
Monostyla quadridentata Ehrbg.
Metopidia Ehrenbergii Perty.
Pterodina patina Ehrbg.
Pterodina parva Ternetz.
Pterodina reflexa Gosse.
Brachionus Bakeri Ehrbg.
Brachionus militaris Ehrbg.
Anuræa cochlearis Gosse.

4. LIST OF SOME ROTATORIA IN MATERIAL BROUGHT FROM SUSAN LAKE.

Melicerta ringens Schrank.
Asplanchna Herrickii de Guerne.
Plœsoma lynceus Ehrbg.
Notommata monopus Jennings.
Brachionus militaris Ehrbg.

5. LIST OF ROTATORIA FROM SPHAGNUM SWAMPS NEAR PINE LAKE.

Near the shores of Pine Lake are a number of "tamarack swamps," formed by the spreading out of small streams before entering the lake. These are filled with *Sphagnum* and similar vegetable life, and covered with a dense growth of underbrush and trees, among which the tamarack is predominant. An examination of material brought from these shows that rotifers are not abundant; the forms found are mostly of the families everywhere characteristic of Sphagnum swamps—the *Philodinadæ Cathypnadæ*, and *Coluridæ*. A list of some forms identified is here given:

Rotatoria from Sphagnum Swamps near Pine Lake.

Philodina aculeata Ehrbg.
Callidina constricta Duj.
Callidina magna Plate.
Callidina papillosa Thompson.
Adineta vaga Davis.
Copeus pachyurus Gosse.
Distyla inermis Bryce.
Metopidia solidus Gosse.
Metopidia triptera Ehrbg.

6. LIST OF SPECIES NEW TO THE FAUNA OF MICHIGAN.

In the foregoing lists, containing in all ninety-four species, the following twenty species are recorded for the first time as occurring in Michigan, and so far as I am aware, in America:

Callidina constricta Duj.
Callidina magna Plate.
Callidina papillosa Thompson.
Callidina musculosa Milne.
Adineta vaga Davis.
Asplanchnopus myrmeleo Ehrbg.
Copeus pachyurus Gosse.
Furcularia micropus Gosse.
Furcularia semisetifera Glascott.
Triophthalmus dorsualis Ehrbg.
Diglena catellina Ehrbg.
Mastigocerca bicristata Gosse.
Cœlopus tenuior Gosse.
Polychætus Collinsii Gosse.
Distyla signifera n. sp.
Distyla inermis Bryce.
Metopidia solidus Gosse.
Pterodina parva Ternetz.
Notholca scapha Gosse.
Notholca foliacea Ehrbg.

7. SYSTEMATIC AND FAUNISTIC NOTES ON CERTAIN SPECIES IN THE PRECEDING LISTS.

(1.) *Synchæta stylata* Wierz.

In my first report on the Rotatoria (Bulletin of the Michigan Fish Commission, No. 3, 1894), I noted the fact that one of the most abundant of the limnetic Rotatoria in Lake St. Clair was *Synchæta stylata* Wierz., while in Whitmore Lake, a small body of water unconnected with the great lakes, *Synchæta pectinata* Ehrbg. was found in equal numbers while *Synchæta stylata* was not present. In the summer of 1894 I hoped to make farther observations on this peculiar difference. In Lake Michigan, Round Lake, and Pine Lake, as was to be expected, only *Synchæta stylata* was found. It seemed possible that in the small inland lake known as West Twin Lake, only indirectly connected with the great lake system, *Synchæta pectinata* would again occur. But such was not the case; *Synchæta stylata* was found in numbers, but no other member of the genus occurred. At the present time, therefore *Synchæta pectinata* has been reported only from Whitmore Lake.

(2.) *Proales laurentinus* Jennings.

This is the form described in Bulletin of the Michigan Fish Commission, No. 3, 1894, as *Notops laurentinus*. The tendency has been in the past few years to consider the genus *Notops* as typically loricate, though belonging to an illoricate family. Of the species described in Hudson and Gosse's Monograph, one is loricate while the other two are not, and the other two genera of this family—*Hydatina* and *Rhinops*—are distinctly illoricate. But *Notops minor* Rousselet, (Journal of the Quekett Microscopical Club, 1892, Series 2, Vol. 4, p. 359), and *Notops pygmæus* Calman, (Annals of Scottish Natural History, Oct. 1892, p. 240), are loricate forms, and show the general tendency to consider this a loricate group. As my species, besides being illoricate, shows undoubted Notommatoid characteristics in other respects, as was noted in my description, it should probably be transferred to another genus. Mr. Charles Rousselet, of London, England has recently discovered on Hertford Heath a species very similar to this, but of a more slender form, showing still farther the relationship with the *Notommatadæ*. His species could not possibly be considered a *Notops*, and as the two undoubtedly belong together I have adopted the suggestion of Mr. Rousselet that both should be referred to the rather heterogeneous and ill defined genus *Proales*.

(3.) *Mastigocerca bicristata* Gosse.

This is not the form mentioned on page 19 of my report in Bulletin of the Michigan Fish Commission No. 3, 1894, but is evidently the real *Mastigocerca bicristata* of Gosse, while the form there mentioned is a new species. It agrees with *Mastigocerca bicristata* Gosse in having two crests, but differs markedly in other respects. Only a few specimens of the real *Mastigocerca bicristata* were found amid *Utricularia* from West Twin Lake. The other two-crested species was very abundant, especially in Round Lake and in the channel between Round Lake and Pine Lake. It is hoped some time in the future to publish careful comparative descriptions of the two forms; at present my notes and figures are not complete.

(4.) *Rattulus sulcatus* Jennings.

This form was described and figured by Bilfinger, in a paper which came just too late to be mentioned in my previous report (l. c.), as *Cœlopus brachiurus* Gosse (?). (Bilfinger *Zur Rotatorienfauna Württembergs*, *Zweiter Beitrag*, Jahreshefte des Vereins für vaterl. Naturkunde in Württemberg, 1894.) As Bilfinger states, the animal is unquestionably a *Rattulus* and not a *Cœlopus*. I have seen the two equal toes widely separated, then closed together again. Furthermore the toes are here very short (0.022 mm.) both relatively and absolutely, forming only about one-seventh of the entire length of the animal (0.144 mm.). I give Bilfinger's measurements, as they agree almost exactly with my own. But in *Cœlopus brachiurus* as described and figured by Gosse, the toes are both relatively and absolutely much longer ($\frac{1}{580}$ inch = .043 mm.), forming about one-fourth of the entire length of the animal. Mr. Charles Rousselet has been so good as to send me some farther notes and figure of *Cœlopus brachiurus* Gosse, as found in England, and from these the distinctness of the two forms seem still more clear. *Cœlopus brachiurus* swims commonly with the toes held straight out behind, according to Mr. Rousselet, whereas in the many living specimens of this *Rattulus* which I have seen, the toes are always retracted, as shown in my own figures and that of Bilfinger. Bilfinger states also that in all specimens seen by him the toes were retracted. In *Cœlopus brachiurus*, even when the toes are "thrust up under the belly," as figured by Gosse in the monograph, they are not held at all in the same position as in *Rattulus sulcatus*, being turned points forward instead of being retracted into the lorica in their natural position.

The following then are the points of difference:

Cœlopus brachiurus Gosse.	*Rattulus sulcatus* Jennings.
Toes of the *Cœlopus* type (?).	Toes equal and side by side (*Rattulus* type).
Length of toes, $\frac{1}{580}$ inch=.043 mm.	Length of toes, .022 mm.
Total length, $\frac{1}{135}$ inch=.185 mm.	Total length, .144 mm.
Toes nearly ¼ of entire length.	Toes about $\frac{1}{7}$ of entire length.
Toes held straight out behind or curved, points forward.	Toes retracted within the lorica.

It seems to me beyond question that the two forms are distinct.

Mr. Rousselet suggested the possibility of the identity of this form with *Cœlopus porcellus* Gosse, and sent me mounted specimens of that form for comparison. The distinction is at once evident on comparing the two animals; moreover, *Cœlopus porcellus* is common in Michigan. I was acquainted with it before I saw this Rattulus.

Rattulus sulcatus it seems to me then is certainly a species distinct from any hitherto described.

(5.) *Distyla signifera* n. sp.

Lorica of the flattened truncate elliptical form typical of the genus: the whole animal in general form much like the *Distyla inermis* of Bryce (Science Gossip, Dec., 1892), though perhaps a little broader. But the *lorica is marked both dorsally and ventrally by crescentic elevations,* arranged in somewhat regular patterns. On the ventral surface these are mostly in longitudinal rows, while on the dorsal surface the pattern is considerably more complicated and at the same time less regular. The two figures, from camera drawings, render a minute description of the arrangement of these elevations superfluous. The dorsal view shows not only the arrangement but also, so far as possible, the size and form of each of the markings; in the ventral view the arrangement is accurate, but each elevation was not outlined separately with the camera. The toes are rod-like, tapering near the distal end on the *outer* side, so as to form an inner

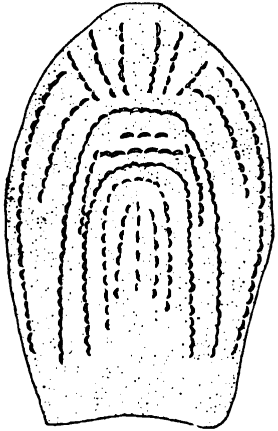

FIG. 2.

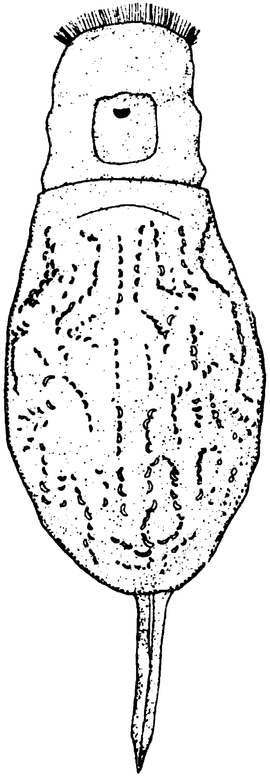

FIG. 1.

point—so that when the two toes are placed side by side only one point is formed. The internal anatomy offers nothing of interest.

All distinctive characters of the animal are better indicated by the figures than would be possible by an extended description.

Length, about .22 mm.

In Utricularia from West Twin Lake; not common.

Figure 1.—Dorsal view of the entire animal.

Figure 2.—Ventral view of the lorica.

(6.) *Monostyla lunaris* Ehrbg.

This common form agrees with descriptions and figures of *Monostyla lunaris* Ehrbg., except that the toe is *not protruded between two spines*, but the foot passes without break into the toe. The foot is *unjointed*, so that this is not the *Monostyla Quennerstedtii* of Bergendal. I have not considered this variation to be of sufficient importance to separate my form from the common one.

APPENDIX IV.

PRELIMINARY REPORT ON COLLECTIONS OF TURBELLARIA FROM LAKE ST. CLAIR AND CHARLEVOIX, MICHIGAN.[1]

BY W. McM. WOODWORTH, INSTRUCTOR IN MICROSCOPICAL ANATOMY, AND MUSEUM ASSISTANT IN CHARGE OF VERMES, HARVARD UNIVERSITY.

A more detailed report with figures will appear in the Bulletin of the Museum of Comparative Zoölogy.

The collections, though small, contribute three new species to the Turbellarian fauna of the United States, two of which have never before been described. In the absence of any data regarding the color and shape of the living animals, the descriptions are necessarily based upon the appearances of the alcoholic material.

Planaria simplex sp. nov.

One Specimen. "Dredge Aug. 11, 1894, off N. Y. Point, Lake Michigan." Length 4 mm., greatest breadth 1.8 mm. General shape ovate. Broadest at $\frac{1}{5}$ the total length from the anterior end, tapering from here to rounded posterior extremity. Anterior end rounded, set off from rest of body by slight lateral indentations at the level of the eyes, i. e., about $\frac{1}{10}$ the total length from anterior end. Broadest diameter $\frac{1}{5}$ the distance from anterior end. No cephalic appendages. Mouth $\frac{1}{3}$ total length from posterior end. Eye spots elongated, crescentic, facing outward and forward at an angle of 45° to the chief axis of the worm. Intestine of the simple triclad type. No signs of sexual organs. Immature. Pigment, located in spots of nearly uniform size, distributed uniformly over all parts of the body; no clear areas at sides of head nor surrounding the eyes. Color of alcoholic specimen ochre yellow.

Planaria maculata Leidy.

One specimen from New Baltimore, Lake St. Clair, Aug. 20, 1893. Seven specimens "on leaves of Nymphea, Twin lakes, Charlevoix, Aug. 6, 1894." Four specimens from "Utricularia-washings, West Twin Lake, Charlevoix, Aug. 13, 1894."

---

[1] Contributions from the Zoölogical Laboratory of the Museum of Comparative Zoölogy, E. L. Mark, director, No. LXIII.

* **Procotyla fluviatilis** Leidy.

"Round Lake July 9, 1894." Probably the above species. Catalogued as "white planarian." No other data.

Mesostoma Wardii sp. nov.

Nine specimens: "Turbellaria [from] algæ, Aug. 20, 1893, New Baltimore," Lake St. Clair. Length 2–3 mm., greatest breadth 1–1.4 mm. Very thin and flat. Anterior end tapering, rounded, marked off from body by a slight constriction. Posterior end tapering sharply and terminating in an acute caudal process. Pharynx large, prominent, in middle third of body. Specimens mostly immature; nothing definite could be determined regarding the sexual organs. Color of alcoholic material yellowish; very translucent.

Mesostoma viridatum M. Sch.

Seven specimens from "Utricularia-washings, West Twin Lake, Charlevoix, Aug. 13, 1894." A cosmopolitan form, but new to the United States.

* **Mesostoma viviparum** Silliman.

"Old channel, Round Lake, Charlevoix, on algæ, July 13, 1894."

* **Vortex armiger** O. Schm.

New Baltimore, Lake St. Clair, Aug. 6, 1893.

* **Vortex** sp.?

"Round Lake, Charlevoix, dredgings from old channel July 20, 1894. Length 0.96 mm., breadth 0.24–0.32 mm. Anterior end truncated posterior end pointed. Pharynx dolioform, in anterior ⅓ of body, traversed by two prominent, lateral, nearly longitudinal bands of light chocolate color. Zoöchlorellæ in central part of body."

Microstoma lineare Oers.

One broken stock from "Utricularia-washings, West Twin Lake, Charlevoix, Aug. 13, 1894."

*"Old channel, Round Lake, Charlevoix, July 13, 1894, in chains of 2 to 4."

* **Microstoma variabile** Leidy.

"Algæ culture, shore, Charlevoix, July 24, 1894. One specimen: chain of four individuals."

Microstoma caudatum Leidy.

Two specimens from "Utricularia-washings, West Twin Lake, Charlevoix, Aug. 13, 1894." Both stocks consisting of two individuals.

Museum of Comparative Zoölogy,
Cambridge, Mass., Jan. 31, 1896.

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*The species marked with an asterisk were not sent to me. The accounts given here are from notes and drawings by Prof. H. B. Ward.

APPENDIX V.

REPORT UPON THE MOLLUSCA COLLECTED IN THE VICINITY OF CHARLEVOIX, MICHIGAN, IN THE SUMMER OF 1894.

BY BRYANT WALKER, DETROIT, MICH.

The molluscan fauna of Charlevoix, is that common to the northern portion of the lower peninsula, and seems to possess but little that is purely local in its nature. As a whole, however, it is distinctly northern in its character, as compared with that of the southern part of the state. In the terrestrial species this is shown in the occurrence of *Vitrina* and numerous species of Zonitidæ and Endodontidæ, to the almost entire exclusion of the larger species of Helicidæ, which abound further south. While in the aquatic forms, the Limnæidæ, Physidæ, and Corbiculidæ, all of which are peculiarly northern in their distribution, form nearly three-fourths of the entire number of species.

The number of species of terrestrial mollusca collected was not as great as might reasonably have been expected. This was probably in part due to the sandy nature of the soil, which prevails all along the eastern shore of Lake Michigan, and partly to the excessive drought which then prevailed. Of the thirty-one species collected, two—*Pyramidula asteriscus* Mse., and *Strobilops virgo* Pils.—are interesting additions to the fauna of the state.

The number of fluviatile species collected was sixty-four, of these thirty-seven were univalves and twenty-seven were bivalves.

The following is a summary of the families represented:

Pulmonata	Limnæidæ	22	
	Physidæ	4	
			26
Prosobranchiata	Valvatidæ	2	
	Viviparidæ	3	
	Rissoidæ	4	
	Pleuroceridæ	2	
			11
Pelecypoda	Unionidæ	9	
	Corbiculidæ	18	
			27

The most striking feature of this fauna is the large number of species belonging to the Corbiculidæ. Of the nineteen species recognized, no less than ten are new to the fauna of the State, and of these, one (*Pisidium milium* Held.) is a European species not before found in this country, and seven (*Sphærium* 1, *Pisidium* 6) are probably new to science.

Other interesting discoveries were a small and very fragile deep-water form of *Limnæa stagnalis* L. and very small globose *Limnæa*, which may prove to be a new form, at High Island Harbor in the Beaver islands; a new fossil *Limnæa* from the marl deposits in Pine Lake at Charlevoix, and the recently described *Planorbis bicarinatus Aroostookensis* Pils. and *P. exacutus rubellus* Sterki from small ponds in the same vicinity.

The fauna of Lake Michigan does not seem to differ materially from that of the neighboring inland lakes. The apparent scarcity of the larger bivalves (*Unio*, *Anodonta* and *Margaritina*) shown in the present collection may possibly be explained by the unfavorable conditions which prevail in the immediate neighborhood of Charlevoix, owing to the exposed coast and rocky bottom in that vicinity. Further and more extended observations will be necessary before such a deduction can be made with any degree of certainty.

This fact, if it be one, does not, however, play any considerable part in the economic features of the fauna which more particularly concern the special line of investigation carried on by the Commission.

It is not probable, owing to their large size and heavy shells, that the Unionidæ afford any considerable amount of fish food. In the earlier stages of development, while yet small they no .doubt are eaten to some extent.

There is no question, however, but that the smaller species which are to be found in great quantities in suitable localities, constitute an important item in the food supply of those species of lake fish, such as the whitefish, sturgeon, etc., which are bottom feeders. The forms thus utilized, would include among the univalves most of the species belonging to the following genera: *Limnæa, Physa, Planorbis, Segmentina, Valvata, Amnicola* and *Bythinella* and among the bivalves, the numerous species of *Sphærium* and *Pisidium.*

The following genera were found in the stomachs of whitefish collected this last season:

Amnicola, Valvata, Sphærium, Pisidium, Limnæa, Physa, Planorbis.

The great abundance of these small mollusks under favorable conditions was well shown at High Island, where a single haul of the trawl over a thick growth of *Chara* brought to surface several hundred specimens of twenty-six species belonging to the following genera:

Limnæa	5
Planorbis	3
Physa	1
Valvata	2
Amnicola	3
Bythinella	1
Pisidium	11

Not only are these forms exceedingly abundant, but their bathymetric range is also very considerable. Thus *Limnæa*, *Planorbis*, *Valvata*, *Amnicola*, *Sphærium* and *Pisidium* were found living at a depth of twenty-five metres. Although, in the few instances in which the dredge was lowered to a greater depth, no mollusca were obtained, this result can scarcely be considered as determinative in this particular. It seems probable, however, that the *Pisidia* range to a much greater depth than the other genera.

(See Rep. U. S. Fish Com. 1872–3, page 707).

As in other forms of animals, the abundance of molluscan life is dependent upon a favorable environment and ample supply of food. All of the univalves species found in the great lakes are vegetable feeders, while the bivalves live upon the minute organisms (algæ) which they find floating in the water. An abundant vegetation therefore is a prime requisite for any extensive development of a molluscan fauna.

This interdependence of the various forms of life was very strikingly illustrated in the fauna of the various inland lakes in the vicinity of Charlevoix. Thus in Pine Lake where, owing to the character of the bottom which is almost wholly composed of a fine disintegrated marl, except in places where a thin coating of sand has been washed in from the shore, plant life is very meagre and stunted in its growth, there was a marked scarcity in the mollusca, not only in the number of species, but in their individual abundance. While in other lakes when the conditions were favorable for a luxuriant vegetation, there was a corresponding increase in the higher forms of life.

The following is a complete list of the species collected:

	Land.	Lake Michigan.	Inland waters.
Limax campestris Binn.	X		
Vitrina limpida Gld.	X		
Gastrodonta nitidus Mull.	X		
Vitrea arboreus Say.	X		
radiatulus Alder	X		
indentatus Say.	X		
Binneyanus Mse.	X		
ferreus Mse.	X		
exiguus Stimp.	X		
Conulus fulvus Dr.	X		
Tebennophorus Carolinensis Bosc.	X		
Pyramidula alternata Say.	X		
alternata alba.	X		
striatella Anth.	X		
asteriscus Mse.	X		
lineata Say.	X		
Polygyra albolabris Say.	X		
Sayi Binn.	X		
monodon Rack.	X		
Strobilops labyrinthica Say.	X		
virgo Pils.	X		
Acanthinula harpa Say.	X		
Pupa contracta Say.	X		
Vertigo ovata Say.	X		
Bollesiana Mse.	X		
ventricosa elatior Sterki	X		
pentodon Say.	X		
Ferussacia subcylindrica L.	X		
Succinea avara Say	X		
obliqua Say.	X		
ovalis Gld. var.	X		
Carychium exiguum Say.	X		
Limnæa stagnalis L.			X
stagnalis L. var.		X	
ampla Migh.			X
emarginata Say.		X	
catascopium Say.		X	X
reflexa Say.			X
lanceata Gld.?		X	

	Land.	Lake Michigan.	Inland waters.
Limnæa pallida Ads.? (fossil)			X
galbana Say. (fossil)			X
desidiosa Say.		X	X
humilis Say			X
sp.		X	
sp. (fossil)			X
Physa ancillaria Say.		X	X
gyrina Say.		X	X
heterostropha Say.			X
integra Hald.		X	X
Planorbis trivolvis Say.			X
bicarinatus Say.		X	X
bicarinatus Aroostookensis Pils.			X
campanulatus Say.			X
multivolvis Case.			X
exacutus Say.		X	
exacutus rubellus Sterki.			X
albus Mull.			X
parvus Say.		X	X
deflectus Say.			X
Segmentina armigera Say.			X
Ancylus parallelus Hald.			X
Valvata tricarinata Say.		X	X
tricarinata bicarinata Lea.		X	
sincera Say.		X	
Campeloma decisa Say.		X	X
integra Say.			X
Milesii Lea.			X
Amnicola limosa Say.		X	X
lustrica Pils.		X	X
grana Say.		X	
porata		X	X
Bythinella obtusa Lea.		X	
Pleurocera subulare Lea.			X
Goniobasis livescens Mke.		X	X
Unio luteolus Lam.			X
borealis Gray.			X
Margaritina rugosa Bar.			X
Anodonta edentula Say.			X
fragilis Lam.			X
Footiana Lea.		X	
Marryatana Lea.			X
Ferussaciana Lea.		X	
subcylindracea Lea.		X	X
Sphærium simile Say.		X	X
striatinum Lam.		X	X
rhomboideum Say.			X
rosaceum Pme.			X
sp.		X	
Pisidium Idahoense Roper.		X	
variabile Pme.		X	X
abditum Hald.		X	X
compressum Pme.		X	X
ventricosum Pme.		X	X
punctatum Sterki.		X	
sp.		X	X
sp.		X	X
sp.		X	X
trapezoideum Sterki, mss.		X	X
sp.		X	
sp.		X	
milium Held.			X

ERRATA.

Page 3, line 13, for " Reighard, 95," read " Reighard, 94".
Page 8, footnote, line 2, for " p. 250 " read " p. 259".
Page 11, second line from bottom, for " p. —" read " p. 72".
Page 12, line 24, for " p. —" read " p. 76".
Page 13, line 28, for " Ryder (81)" read " Ryder (84)".
Page 16, line 7, after " species " insert " of insects".
Page 17, sixth line from bottom, for " Reighard (95)" read " Reighard (94)".
Page 19, line 15, for " Forbes (82)" read " Forbes (83)".
Page 21, line 11 of table, for " *lustuca* " read " *lustrica* ".
Page 21, line 15 of table, for " Lan." read " Lam."
Page 27, line 26, for " depedent " read " dependent ".
Page 28, second footnote in third and in last lines, for " *Melonia* " read " *Melosira*".
Page 36, last line above table omit the word " total ".
Page 37, line 20, for " afford " read " affords ".
Page 38, second table in first line, for " 10.7 " read "10.0," and for " 3.6 " read " 4. 3 ".
Page 38, second table in last line, for " 19.5118 " read " 19.4987"
Page 38, last line, for " 3.5 per cent " read " 4 per cent".
Page 43, last table in last column, for " 3.98 " read " 3.97".
Page 45, line 24, for " agreed " read " agrees".
Page 55, line 8, for " Clain " read " Clair".
Page 55, line 24, for " Reighard (93)," read "(94)".

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PLATE I.

Tabular View of Bottom Hauls with Vertical Net.

A, in Lake Michigan.

B, in Round and Pine Lakes.

Vertical lines indicate stations, each of which is designated by a Roman numeral at the upper end.

Horizontal lines denote distance or amount as shown at the margin.

D--------D. Indicates depth of various stations.

T--------T. Shows total volume of plankton in bottom hauls with vertical net.

R--------R. Shows the estimated volume of plankton per cubic meter of water in the same hauls.

? Denotes a doubtful observation.

For further details see text.

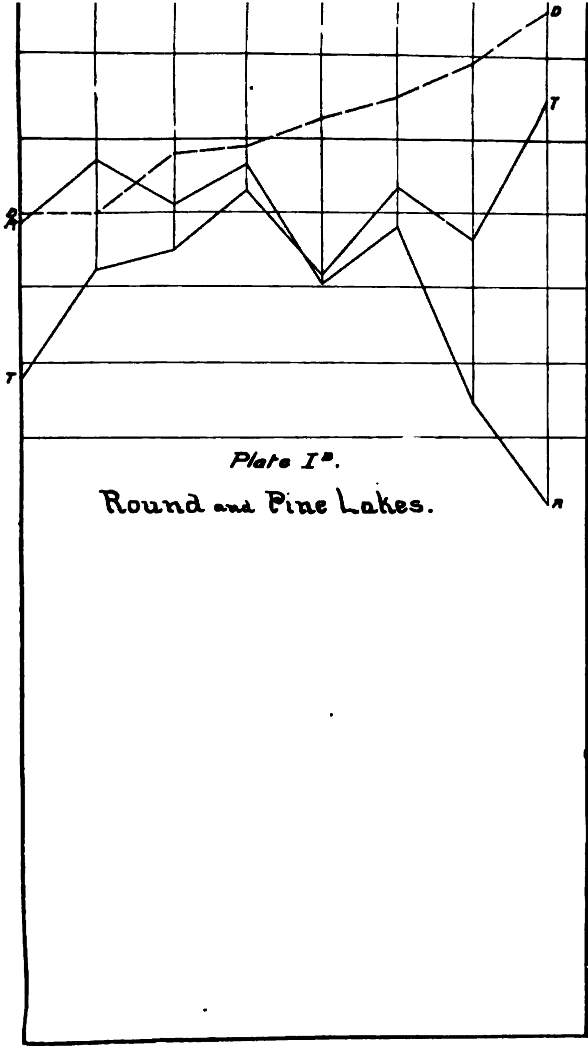


Plate Iᴮ.

Round and Pine Lakes.

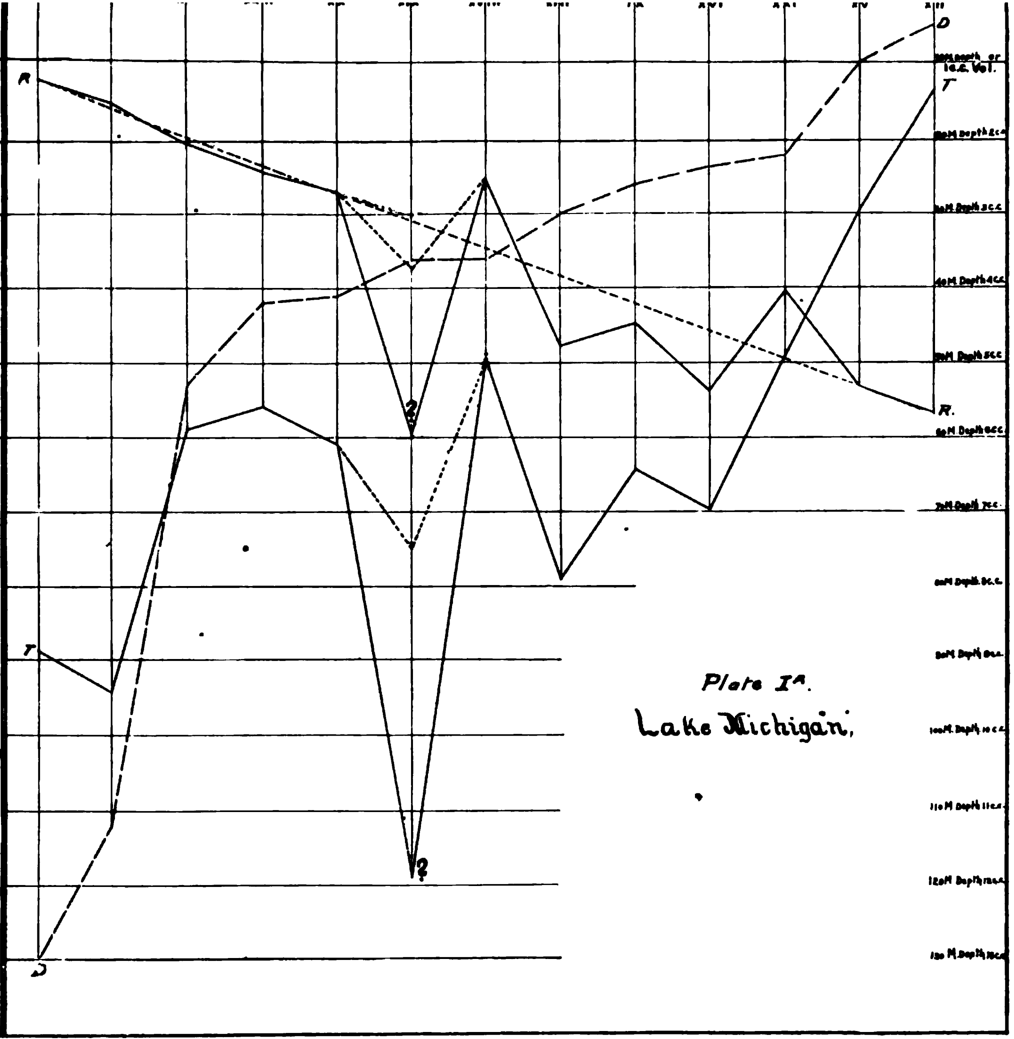


Plate Iᴬ.

Lake Michigan.

PLATE II.

TABULAR VIEW OF STRATAL HAULS WITH VERTICAL NET.

A, IN LAKE MICHIGAN.

B, IN ROUND AND PINE LAKES.

Vertical lines indicate stations, and horizontal lines amount of plankton obtained

D--------D. Indicates the depth of various stations.

S--------S. Shows the amount of plankton per cubic meter of water in hauls from 2m. to surface.

2–5m., the same in hauls from 5m.–2m.

5–10m., " " " " " 10m.–5m.

10–25m., " " " " " 25m.–10m.

25–50m., " " " " " 25m.–50m.

50m.–bottom, the same in hauls from bottom to 50m.

? Denotes a doubtful record or observation.

Further details in text.

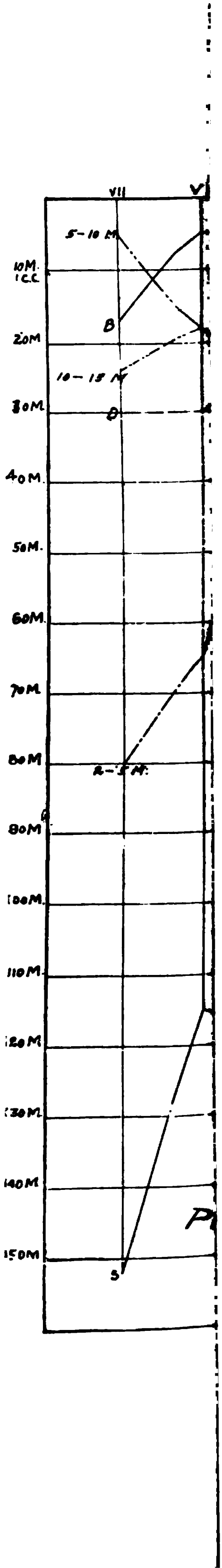

VII
V
5-10 M
10M
I.C.C.
B
20M
10-15 M
30M
B
40M
50M
60M
70M
80M
2-5 M
80M
100M
110M
120M
130M
140M
P
150M
S

PLATE III.

TABULAR VIEW OF PLANKTON HAULS IN LAKE ST. CLAIR. THESE WERE PLOTTED FROM RESULTS GIVEN BY REIGHARD, 94, p. 35.

Stations are indicated by vertical lines; distances or amounts by horizontal lines.

D--------D. Indicates the depth of the various stations.

T--------T. Shows the total amount of plankton obtained in bottom hauls.

R--------R. The amount of plankton per cubic meter of water for the same hauls.

S--------S. The amount of plankton per cubic meter of water contained in the surface 1.5m.

1.5–4.5m. The amount of plankton per cubic meter of water in the stratum 4.5m. to 1.5m., or bottom to 1.5m. if shallower.

B--------B. The amount of plankton per cubic meter of water in the stratum from bottom to 4.5m.

For discussion and explanation see text.

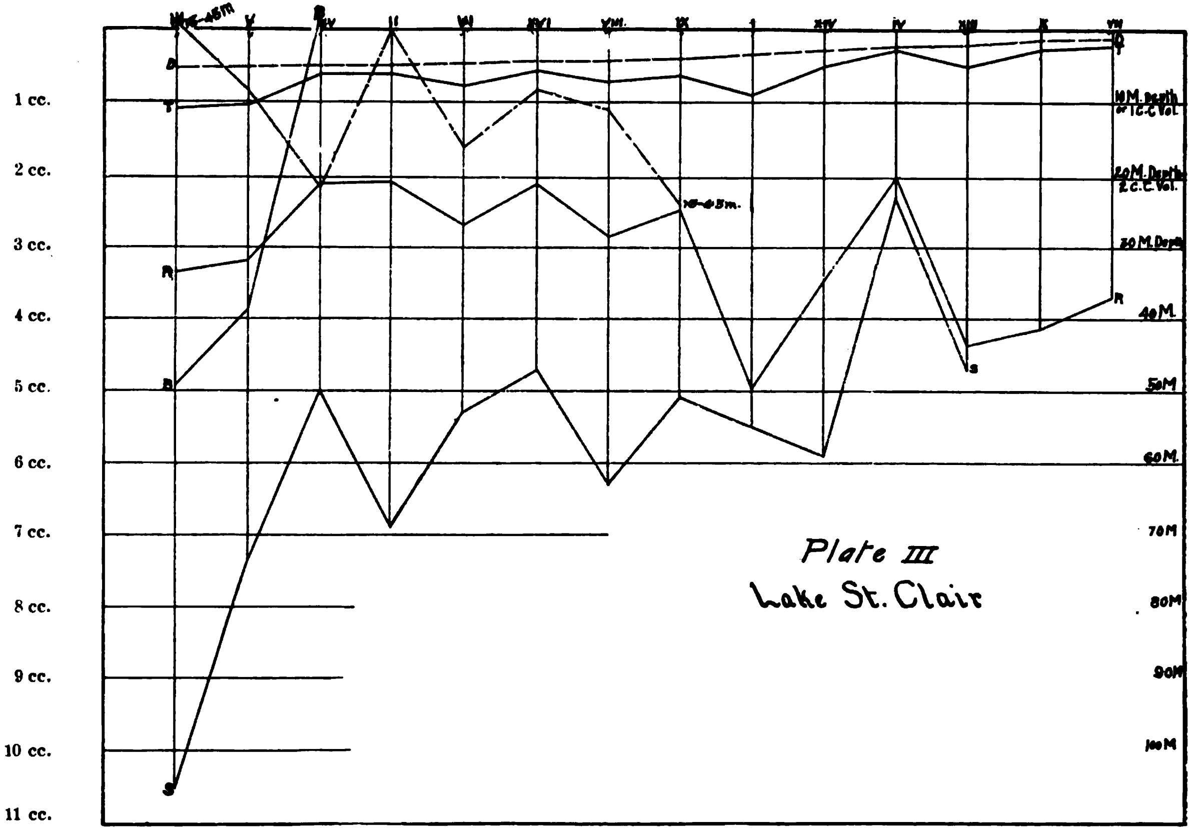


Plate III
Lake St. Clair

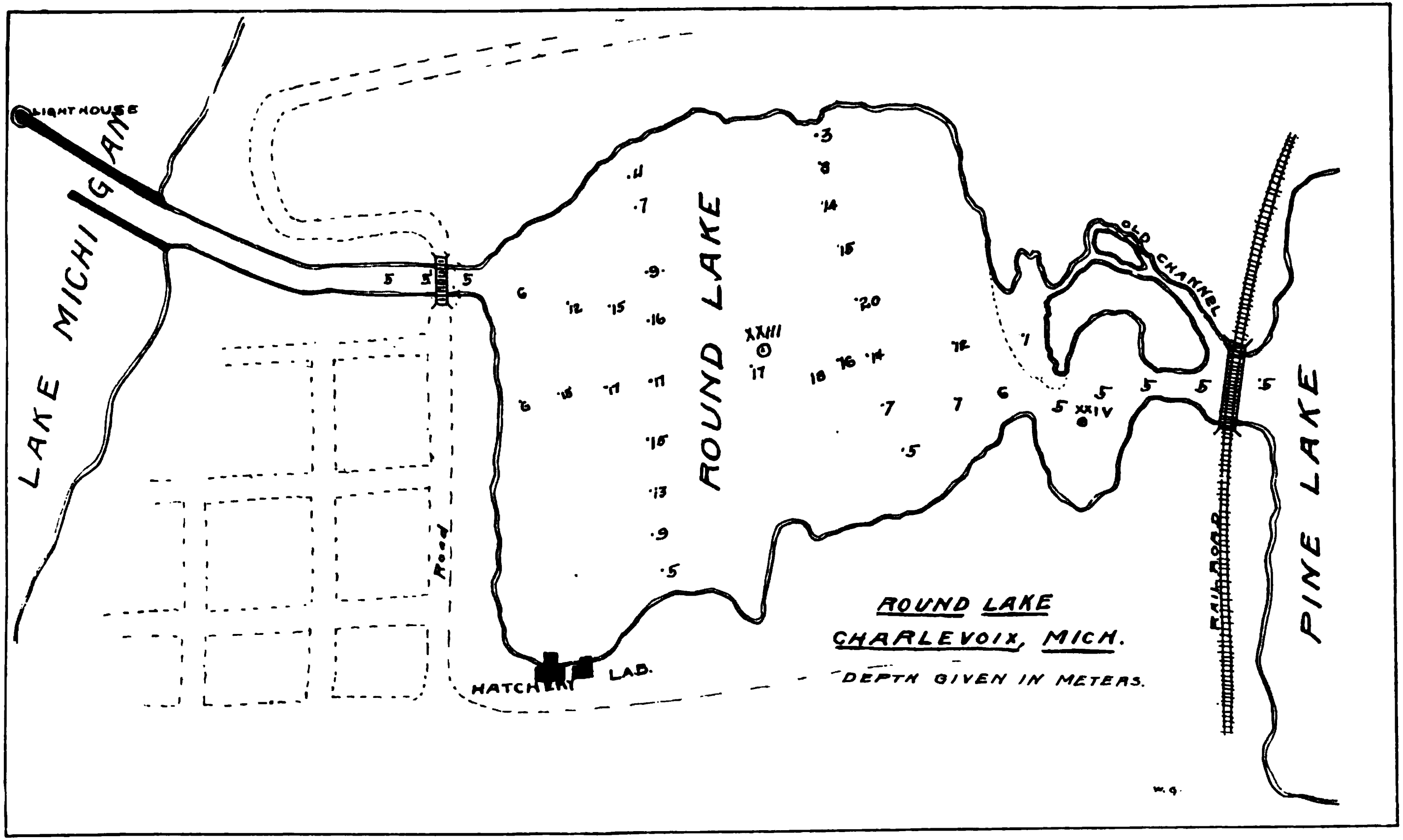
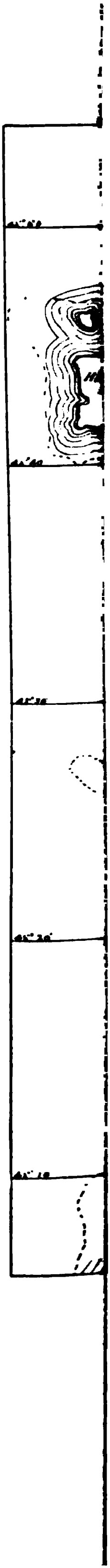

LIGHTHOUSE
LAKE MICHIGAN
Road
HATCHERY
LAB.
ROUND LAKE
XXIII
XXIV
OLD CHANNEL
RAILROAD
PINE LAKE
ROUND LAKE
CHARLEVOIX, MICH.
DEPTH GIVEN IN METERS.
W. G.

PLATE IV.



SIXTH BIENNIAL REPORT

OF THE

LIVE STOCK SANITARY COMMISSION

FOR THE

YEARS 1895 AND 1896

BY AUTHORITY

LANSING
ROBERT SMITH PRINTING CO., STATE PRINTERS AND BINDERS
1897

STATE LIVE STOCK SANITARY COMMISSION.

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STATE VETERINARIAN.

PROF. E. A. A. GRANGE,
STATE AGRICULTURAL COLLEGE,
LANSING, MICHIGAN.

REPORT

OF THE

STATE LIVE STOCK SANITARY COMMISSION

FOR THE BIENNIAL PERIOD OF 1895 AND 1896.

TO HON. HAZEN S. PINGREE, *Governor of Michigan:*

The Michigan State Live Stock Sanitary Commission submits the following as its sixth biennial report:

As far back as 1880, and perhaps at an earlier date, the farmers of the State, and, more especially, those actively engaged in the live stock industries, began an active discussion of the propriety of asking the legislature to enact some suitable and effective live stock sanitary laws. All parties conceded the necessity of the same, in view of the large extent of the live stock interests of the State. Glanders existed in most of the counties of the State. Scab and foot rot were not uncommon among sheep. Texas fever killed hundreds, yes, thousands of dollars worth of our cattle annually. Contagious pleuro pneumonia had been imported forty years before, and had a substantial foothold among herds of milk cows in parts of Pennsylvania, Maryland. New Jersey, New York and the New England states, and occasional herds coming over the Alleghanys with migrating families were bringing the dread scourge westward. Hog cholera was devastating the swine herds of Ohio and Illinois, and Michigan was having sufficient outbreaks of this plague to know something of the devastating and destructive character of the malady so far as the swine breeder was concerned.

The usual result of discussion among intelligent men is action. The history we are now recalling was no exception to the general rule. This class of legislation was entirely new in this State and practically new in this country. The trail to be pursued was not even blazed out, much less beaten by a path one might follow. All the live stock associations and many of the agricultural societies of the State, as well as other gatherings of farmers, considered the subject, and various forms of proposed legislation were exploited. Large bodies move slow. They usually move effectively.

The result reached was that all interested fully agreed that a Commission was the proper body to be appointed under a law for protecting the live stock of the State from all contagious or infectious diseases of a malignant character. A committee of gentlemen were selected representing the different live stock interests, to exploit the idea and draw a bill or bills adequate to the occasion and ask the legislature to pass the same. The result of the labors of this joint committee was the drafting of two bills, which were practically the same as the present live stock laws of the State. These bills were endorsed by the various live stock associations at their annual meetings in 1884. They were approved by the entire membership of the State Board of Agriculture, the State Agricultural Society, and the outgoing and incoming Governors. The outgoing Governor, Begole, called especial attention to it in his exaugural, in view of the fact that the general government had just by act of congress created the Bureau of Animal Industry. Many members elect of the legislature were active in assisting the committee to prepare the bills—one of the committee being a member elect of the house. The bills were duly introduced in the lower house, and after deliberate and protracted discussion, were passed without serious opposition. They passed the senate with the important exception that on the third reading of the general bill, a senator asked that horses and sheep be exempted from the operations of the law. Upon the senator's request, a motion to amend the bill as just indicated carried, and the house concurred in the amendment. Two years later the legislature amended the law, making it operative as to horses and sheep. Few general laws upon our statute books affecting great agricultural interests as these laws do, received more careful and deliberate consideration or more general support both in the legislature and among the agriculturists of the State. These laws have been in active operation for a dozen years as to all domestic animals except sheep and horses, and as to them for ten years. We may fairly pause to meditate as to results.

During that time we have seen Illinois spend hundreds of thousands of dollars, other states vast sums, and the general government itself more than a million of money in wiping out contagious pleuro pneumonia among cattle in the United States, and yet Michigan, lying right along the path of the cattle of commerce in transit from west to east, by the rigid enforcement of quarantine under this law, never had a case of this fatal bovine malady in the State.

Texas fever. While the general law, act 128, session of 1885, took immediate effect, and the Commission was at once appointed under it, yet act 198, commonly known as the Texas fever law, passed by the same legislature, for manifest reasons, did not take effect until 90 days after the legislature adjourned. Before this law became operative, this Commission was called to Detroit to witness some of the ravages of this disease. This was no exceptional year, and yet in Detroit that season over 200 cows, mostly the property of poor people, succumbed to the malady. The estimated value of the same at that date was over $10,000.

Other towns and cities also had outbreaks of Texas fever. Under the operations of this law and the rules of this Commission, not an animal has died in this State for the last two years and no citizen of the State has lost a dollar by the disease during the last five years. It may be inferred that Texas cattle are no longer handled in this State, but that would be a great error, as many hundred more are now annually slaughtered in this State than were slaughtered previous to the enactment of the law, and many thousands more cross the State with the cattle of commerce, than did cross at the period we are now discussing. More than this, we have the satisfaction of seeing the general government adopt the plan of our law in dealing with Texas cattle all over the country.

CATTLE DISEASES.

TUBERCULOSIS.

With contagious pleuro pneumonia banished from the United States, and with Texas fever under complete and perfect control, the cattle grower still faces a serious, insidious, destructive, contagious disease in bovine tuberculosis. There can be no sort of doubt today with an observant cattle grower as to the contagious character of tuberculosis or consumption among cattle. This Commission is actively engaged in suppressing such outbreaks as are brought to its attention. This Commission is of the opinion that the general cattle stock of the State are but little affected with this disease, but in herds where the disease has a foothold, and the conditions and environments are favorable to its development, a large percentage of the herd will be likely to be affected. We know of no cure for this disease, and have followed the policy of destroying or closely quarantining affected animals to arrest its farther spread. The State Veterinarian, Prof. Grange, treats very fully in his report on this malady, which is attached to this report, and special attention is hereby called to same.

In the carrying out of the policy of condemning cattle to slaughter which are affected with tuberculosis, the Commission have encountered opposition owing to the fact that the law does not provide some plan of appraising cattle thus affected, in comparison to the same class of cattle when in perfect health. As a result of the opposition above referred to, certain parties in Wayne county have invoked the courts of that county to restrain the Commission from executing its orders for the destruction of certain cattle in Oakland county thus affected. While the case here referred to has been pending for a considerable time, this Commission has thus far been unable to advance the case to even a partial hearing in the courts, and therefore no prediction is here entered as to the final results, when the case finally reaches a hearing on its merits.

It is proper to here record that in following the plan of testing such herds of cattle with tuberculin to detect the presence of tuberculosis as are brought to the attention of the Commission, as being likely to be affected with the malady, a wide general field has been covered. We have tested suspicious herds scattered from the south line of the State to the shores of Lake Superior and the extreme western line of the upper peninsula. The experience obtained is a repetition of the experience of all investigations. That is, that this disease is highly contagious among cattle in the latitude and longitude of all of the State of Michigan where herds are kept under favorable environments for its propagation and spread. No breed, color, age, class or kind of cattle are exempt from its ravages.

This Commission for the biennial period under present review have pursued the same general policy as to Texas fever and the handling of Texas cattle, as was pursued during the period covered by our fifth biennial report, with the result as already stated, that there has not been a case of Texas fever in the State during the two years just passed.

It may be further said that the general policy of the Commission as to quarantines and other restraining measures to control and suppress contagious animal diseases, has been substantially the same as was followed during the biennial period next preceding this.

DISEASES OF HORSES.

GLANDERS.

During the ten years the Commission has been dealing with glanders, great progress towards the desired end has been made. Not one case is now reported, where scores were originally reported. Whole congressional districts are now probably exempt from this loathsome disease. This Commission has had ample evidence presented to it, showing that this disease has not only destroyed a large number of horses in this State during the last ten years, but has killed several men and women as well.

The experience of this Commission has not been extensive in dealing with any other of the maladies affecting the horse, except glanders.

DISEASES OF SHEEP.

As to scab and foot rot in sheep. We would not now know where to search for a specimen of foot rot in the State. We know of no cases of scab among sheep at large. Thousands of sheep and lambs are bought in the Chicago stock yards annually, and brought to this State to feed. These feeding sheep have all been exposed to scab as the Chicago, Buffalo, and other extensive sheep yards, are fairly infested with the scab mite. These feeding sheep are all dipped by the feeders and are finally, when fattened, sent to the shambles for slaughter.

Probably the most serious malady in front of Michigan sheep growers today is the various kinds of internal parasites. These lung, stomach, and intestinal parasites are not an original Amercan product. Like many of the weed pests of our fields, the original seed was imported. They are apparently much more fatal with lambs than with old sheep. This Commission can do but little to stay the ravages of these destructive parasites. The sheep growers themselves can do most by the dosing of each individual with some anti-parasitic or vermifuge. The damage to the last years' lamb crop in this State from these internal parasites was very large.

The very interesting treatise on internal parasites of sheep, by the State Veterinarian, Prof. Grange, accompanied with illustrations, and embodied in this report, should be carefully considered by all sheep growers.

DISEASES OF SWINE.

HOG CHOLERA.

As to hog cholera, it is to be regretted that science has as yet not discovered either a preventative or a cure for this destructive malady. This Commission, however, by quarantine and other preventative and restraining sanitary measures, has held in check many outbreaks, and can wipe the disease out of Michigan if science can exploit a plan to eradicate it in any state.

Outbreaks of hog cholera have been numerous in the State during the past two years, and great losses have been sustained by the farmers in many localities, not only by the destruction of animals and herds, but in making it necessary for them to discontinue the raising of swine for a term of years, or until the last trace of the contagion had disappeared from the locality, and the deadly germs of the disease, concealed in litter about pens and yards, and in the soil, had ended its existence. There is no doubt but what the annual losses sustained by the farmers of the State from hog cholera exceed those from all other diseases of domestic animals. Hence, it is important that every precaution known to science, and knowledge gathered from experience with the disease, be used in enforcing sanitary measures to prevent its introduction and spread. While it is quite probable that in some cases the disease may yield to treatment if commenced in the first stages, yet prevention is cheaper and more satisfactory than treatment.

The following from a report of the supervisor of Riga township, in Lenawee county, sent to the Commission in September, 1895, may be of interest in this connection: "I have visited twenty-seven farms in this township, and found that the whole number of swine which were on these farms previous to the outbreak of the disease was 527, of which 303 have had the disease or are now sick, and 224 have already died. The foregoing constitutes about one-fourth of the farms infected with the disease. It already covers one-half of the township and is spreading fast to the east and south." The farms of that section of the State are largely underdrained with tile, and it is reasonable to infer that this drainage from yards and fields where the disease existed, and where the carcasses of dead animals had been buried near the drain tile emptying into open watercourses, was the fruitful and certain cause of the rapid spread of the contagion, and rendered it impossible to arrest its progress. The result was that over a large area of that section of the State, the swine raising industry was practically destroyed. Outbreaks in other portions of the State have been numerous, but not so widespread, uncontrollable and destructive as in the tiled districts. By prompt and thorough action in adopting and rigidly enforcing quarantine and sanitary measures, the disease has in some instances been confined to a single farm, and in others to a very limited territory.

The National Bureau of Live Stock Industry is still carrying on experiments in treating, and for preventing the introduction and spread of the disease, but nothing new of late has been discovered which can be recommended with confidence. The practical work of the Commission, in dealing with outbreaks of hog cholera during the last two years, has fully confirmed the opinion given in our last biennial report, in relation to the nature, symptoms, treatment and means by which it is conveyed from herd to herd, and we deem it proper to not only repeat, but emphasize the following from that report:

"Hog cholera germs are very hardy and vigorous. They are able to live for a long time and multiply in the water of ponds and streams. They may live in the soil for at least three months, and in accumulations of straw and litter for a much longer time. They withstand drying and other adverse conditions in a remarkable manner, and will survive in a frozen state for two or three months.

CAUSE OF OUTBREAKS.

In every instance where definite information could be obtained, outbreaks of hog cholera, or contagious diseases among swine, have been traced to the importation of swine from other states, or from infected districts in this State, or from railroads transporting diseased animals. There is no question but what the use of cars in which diseased swine have been transported, for carrying other live stock and freight without being disinfected, is a fruitful source of many outbreaks of hog cholera. When the germ is once planted and the disease makes its appearance in a herd, its spread to other herds in the vicinity can only be prevented by exercising and enforcing the most careful and rigid measures. In one instance which came to the knowledge of the Commission, two hunters passed through a field where diseased swine were kept, and then through an enclosure on another farm some distance away where there were healthy swine; and in a few days the disease broke out in the latter herd. In another case the evidence seemed almost positive that the germs of the disease were carried by the water of a heavy shower running down a ravine usually dry; and in other instances they seemed to have been carried through drain tile; showing conclusively that the disease can be carried from herd to herd, and from farm to farm, not only by "flesh devouring animals, birds and insects," but by watercourses and heavy showers washing under fences and across enclosures, and on the feet of persons and animals. A lump of soil or manure no larger than a mustard seed, adhering to the shoe of a person, or foot of a dog or other animal, may carry germs of the contagion sufficient to inoculate a herd of swine.

TIME OF INCUBATION.

The time that elapses between infection and the appearance of the symptoms of illness, known as the period of incubation, varies from four to twenty days. During this period the germs are multiplying slowly, and gradually overcoming the vital powers of the animal by means of the poisonous substances which they produce as the result of their growth."

The following treatment recommended in our fifth biennial report has been tried by different parties, and where the directions were followed and the treatment thoroughly used, it has been productive of good results. The government experiments of 1894 seem to indicate with some degree of certainty that this treatment if properly applied may be successful:

Wood charcoal	1	pound
Sulphur	1	"
Sodium sulphate	1	"
Antimony sulphide	1	"
Sodium chloride	2	pounds
Sodium bicarbonate	2	"
Sodium hyposulphite	2	"

These ingredients should be completely pulverized and thoroughly mixed.

Dose, one large tablespoonful of the mixture once a day for each 200 pounds weight of the hogs to be treated. The medicine should be given in soft feed, as corn meal or ground oats, or crushed wheat, mixed with bran, or middlings well moistened with hot water.

Animals that are too sick to eat the mixture should be drenched with the medicine, well shaken up in water. This can be done by slipping a noose over the upper jaw or snout of the animal and elevating its head sufficient to allow the medicine to be poured from the horn or drenching bottle into the corner of the mouth. Pull the cheek away from the teeth and let the medicine run into the pouch thus formed. Great care should be exercised in drenching hogs or they may be suffocated. The medicine should be poured slowly and time given for the animal to swallow. This medicine is also recommended as a preventive to these diseases, and for this purpose should be put in the feed of the whole herd, taking care that each animal receives its proper share. It is also claimed to be an excellent appetizer and stimulant to the processes of digestion and assimilation, causing unthrifty hogs to assume a thrifty condition and to take on flesh.

It must not be forgotten that in order to secure good results from this treatment, diseased animals must be kept in dry and comfortable quarters and fed on soft and easily digested food. The sick should be separated from the herd, but the sick and well should be treated alike, in order to cure the former and prevent the incubation of the disease in the latter; for prevention is cheaper and more satisfactory than medical treatment.

CARE TO GUARD AGAINST THE DISEASE.

Healthy swine should not be allowed to come in contact with diseased animals or herds, strange swine, the history of which is unknown, offal from establishments using carcasses of swine, recently infected grounds or buildings, railroads carrying swine, or polluted streams. When the disease has actually appeared in a herd, heroic measures should be resorted to at once, to stamp it out and prevent its spread. The herd should be rigidly quarantined as far as possible, and all means for conveying the germs of the disease to other herds should be guarded against. All dead animals should be deeply buried or burned at once, and vehicles upon which they are carried away disinfected. The yards and premises where diseased swine are kept should be repeatedly and thoroughly disinfected, and when vacated not only disinfected but closed up from all other animals until there is reason to believe that the germs have been destroyed. Mere freezing does not kill the germ, but the disease usually dies out during the winter, if the frost can penetrate the litter and soil in every portion of the yards and under the buildings where the diseased animals have been kept. The germ is often protected during the winter, by straw stacks, and litter in the yards and under the buildings.

HOW TO DISINFECT.

The following disinfectants are recommended:

1. Slacked lime, in the proportion of one-half pound lime to one gallon of water.
2. Equal volumes of crude carbolic acid and ordinary sulphuric acid mixed together, and two ounces of the mixture added to a gallon of water.
3. Sulphuric acid added to water, one ounce to a gallon.
4. Boiling water, where the application can be made direct.
5. Corrosive sublimate (mercuric chloride), in the proportion of one dram to a gallon of water.

The lime is the best and cheapest where it can be used. No. 2 is said to be more active. Place the vessel containing the crude carbolic acid in cold water and then add the sulphuric acid, to prevent undue heating of the liquid. The solution should be made in wooden vessels, as sulphuric acid and corrosive sublimate attack metals. As corrosive sublimate is very poisonous, the solution should not be made stronger than indicated. Each of the solutions recommended is strong enough to kill hog cholera and swine plague bacteria.

The Commission desires to request all parties, whether officials or private individuals, when reporting cases of contagious disease, to note such particulars in relation to the diseased animals as will at once and exactly and definitely locate the cases. Kindly state name of owner or party in charge. Also exact location in township, giving section or part of section if practicable. Give name of nearest railroad station and distance therefrom. If located about equal distances from different stations, particularly if stations are located on different railroads, give names of each. Give as detailed a history of the case or cases as circumstances will permit. This information is essential to facilitate the speedy and economical investigation necessary in all cases.

The very interesting and instructive report of Prof. Grange, State Veterinarian, is herewith submitted, and especial attention is called thereto.

H. H. HINDS.
J. J. WOODMAN,
J. E. BARRINGER,
State Live Stock Sanitary Commission.

LANSING, MICH., March 25, 1897.

REPORT OF THE STATE VETERINARIAN.

LANSING, MICH., Jan. 2, 1897.

Hon. H. H. HINDS, President State Live Stock Sanitary Commission:

SIR—Since submitting my last report to your commission I have visited various quarters of the State for the purpose of investigating reported outbreaks of contagious disease.

On previous occasions that loathsome disease glanders occupied more time and attention from the State Veterinarian than all the other contagious diseases combined, and the demands for information concerning it came from so many sources that a description of the complaint was prepared by me, which has already been placed in the hands of the public, through the fourth biennial report of the State Live Stock Sanitary Commission, so it may be unnecessary to say more concerning the peculiarities of that disorder at this time, except to add that present appearances indicate that the labor of the Commission has not been in vain, for reports of outbreaks of this disease are now few and far between, when formerly they were very frequent.

Purpura Hœmorrhagica, or purple fever, has been brought under my notice in a few instances during the past two years, but, as its more salient features have been described and treatment recommended (see page 24, etc., of the fourth biennial report), I will refer the reader to those paragraphs for further information concerning this interesting complaint should it be desired.

The increasing demands for information concerning tuberculosis has caused me to prepare a somewhat detailed description of it, with the hope of answering some of the many questions which are asked from day to day. This disease is, perhaps, creating more discussion in scientific journals, the public press, and amongst laymen in general, than any other in the list of communicable complaints. Is this to be wondered at, when we are told by the highest medical authorities that one-seventh of those people who pass away, die of consumption? So, naturally, we find laymen and scientists alike searching for information concerning it. We also find all civilized governments employing their most distinguished investigators to follow it through various avenues, while state, provincial and municipal authorities, as well as private individuals, are in common trying to combat the army of invading germs which are intent upon the destruction of our bodies. It is encouraging to feel that after years and years of unceasing labor it now begins to look as if mankind would eventually be rewarded for his persistent and meritorious efforts in the stand he is taking to defend himself.

In describing this disease I shall discuss it under the following heads: definition, history of the disease, ætiology or cause, life history of the germ, dissemination of the virus, avenues of infection, symptoms of the disorder, in such animals as cattle, horses, sheep, hogs and birds, treatment of the scourge, and last, but not least, prevention.

NAME.

The complaint is known under a variety of symptoms which have some relation to the symptoms or other phenomena of the disease. The ancient name of phthisis was given to it by the Greeks, and in their language means wasting or consumption, even today the term consumption is frequently used, thus we have pulmonary consumption, consumption of the bowels, etc., etc., the more classical, however, using the terms pulmonary phthisis or tabes (wasting) mesenterica, as the case may be. In Germany the disease is often spoken of as perlsucht, or, as we have it, pearl diseases of cattle, which name is due to the formation in the animal of little pearly-like nodules, or it is sometimes spoken of as schwinden (to vanish or waste away), while in Great Britain the name granulia has been proposed, having reference to little granular enlargements or miliary tubercles, which are often found in afflicted animals.

DEFINITION.

Until somewhat recently tuberculosis was regarded as a sporadic non-contagious disease due to a variety of imaginable causes, all of which were without scientific foundation, and as might be expected, sooner or later fell to the ground, consequently the definition varied according to the symptoms or lesions presented, as well as to the fancy of the observer. In the present light of what we are pleased to call advanced knowledge, tuberculosis may be defined to be a communicable disease dependent upon a specific micro-organism, known to science as the Koch bacillus of tuberculosis.

HISTORICAL SKETCH.

It is doubtful if there is any disease having a more interesting history than the one in question, indeed it often becomes romantic, for in its subtle manner it strikes down kings and princes, rich and poor, in the same merciless manner, while it invades the economy of the high-class pedigreed cow and wipes her out with as much certainty as it does the native scrub.

The date or the time when this disease made its first appearance on earth is wrapt in considerable obscurity. The bacteriologist contends that long before the existence of man the special bacterium which causes it, lead a saprophytic existence (lived beyond or outside of the animal economy), but through environment it has become a parasitic microbe (one which lives in or upon the animal economy). Be this as it may, the disease has been noticed by veterinary writers, including Columella, who flourished about 1800 years ago, as well as others before him. The history of the disease is usually regarded as extending over five periods. The first was that of ancient history. During all this period the disease was observed only from a clinical standpoint, as the writers of antiquity had no knowledge of tuberculosis in its present sense, and every nodule, mass or induration was then called tubercle. Miliary tubercles were. however, entirely unknown, and when finally discovered were regarded as mere curiosities, but many ancient writers were quite familiar with the fact that disease marked by nodules was attended or caused by the formation of abcesses and ulcers in the lungs, hence phthisis was regarded as belonging to the general class of diseases characterized by the formation of pus. Hippocrates, now regarded as the father of medicine, and who flourished 400 B. C., accepted this view, deriving the pus, from the known proclivity of glands to suppurate, indirectly from the brain, the greatest gland in the body. The brain formed mucous, which, flowing down from the palate and pharynx, produced pus in the lungs. Not every cause of phthisis emanated from the brain. Some pneumonias and varieties of pleurisy were supposed to be followed by phthisis at times; mucous, flowing from the brain and failing to be ejected as sputum, was thought to be converted into pus by the ancients, and even the blood resulting from a hemorrhage was supposed to be changed into pus. Phthisis or wasting was regarded as the outward expression of pus in the lungs, but, singularly enough, not every formation of pus in the lungs produced phthisis. Hippocrates encountered hard masses in the lungs, which he called pymata, and on this account it is now thought that Hippocrates was familiar with tuberculosis; but Virchow has proven that pymatæ were not tubercles even in the anatomical sense, but were abscesses matured for artificial or spontaneous discharge. In the year 50 A. D., Celsus recognized the disease under three heads: The first due to lack of induration, the second the effect of chronic disease and poverty, while the third was wasting, or phthisis, as it was then called. About this time Aretæus contended that phthisis came from pus, using the term pye as a synonym for the disease. But he might also have advanced one step further in his pathology in the separation of empyema, which he regarded as a distinct disease. The symptoms of phthisis were described by this early writer in the following terms: "It is accompanied with heat of a continued character, but latent, ceasing now at no time, but concealed during the day. The sputum was described as being of several different varieties, when coming from people affected with this disorder, such as yellowish white, whitish green, glutinous, etc., etc. The voice was hoarse, neck slightly bent, complexion pale, cough, nose sharp and slender, cheeks prominent and red, eyes hollow, brilliant and glittering, slender parts of the jaws rest on the teeth as if smiling, muscles of the arms wasted, mammary glands shrunken, little if any flesh upon the ribs, articulations at the vertebræ quite visible, other joints clearly developed, prominent and devoid of flesh."Aretæus was wise enough to treat the disease on hygienic and dietric principles, and in many respects the advice of this ancient author was such as is given today by advanced scientists. After the writings of Aretæus little was done with regard to tuberculosis for about 100 years, until Gaylon in 140 A. D. took up the subject and discussed it from the curative standpoint. He recognized the fact that the dry atmosphere was favorable to patients suffering from this disorder, and to secure the healing process in the lungs he advised his patients to go where the air was dry.

The first period ended, historically speaking, with the third century, and the disease seemed to sink into oblivion for about 1400 years, as little advanced progress was made in the study of it, although the Jews as far back as 1135 required the lungs and other parts of cattle used for food to be examined for tubercle, as well as other loathsome diseases. No doubt the slow progress in the study of this disease at this time is to be accounted for by the want of knowledge of the anatomy of the parts which the physicians of those days were called upon to treat, and it is a notable fact that the progress in the study of this, as of all other affections, became possible only with the study of anatomy, which could be pursued with impunity only as late as the beginning of the 17th century, from which time new discoveries followed, step by step. The first disclosures of post mortum examinations revealed hard masses which were thought to be tubercles. In 1680 Silvius made the discovery that these tubercles or hard masses sometimes softened to form pus in their center. These tubercles he believed to be glands, and it was unfortunate for the progress of the correct knowledge of the disease that the difference between healthy and unhealthy glands was not clearly understood.

During the 18th century an advanced discovery was made by Mangetus, who described a case of general tuberculosis with dissemination of miliary tubercles, which he likened for the first time to millet seeds. These were found in the liver and spleen, kidneys, mesenteric glands and intestines. His description resembles that of perlsucht, or pearl disease of cattle of the present day. In 1783 it was believed by those who were regarded as advanced scientists that these little tubercles were the sole cause of phthisis or consumption. Morgagni, in 1761, thought phthisis arose from many causes, only one of which was tubercle, and when it originated from this cause he firmly contended that it was of a contagious nature.

The 18th century closes the second period in the history of tuberculosis. The 19th century furnishes the third period in the history of the disease, and from an historical standpoint the first quarter of this century is full of interest through the contributions of Bayle and Laënnec. Though there was between these contributions and those of their predecessors no lapse of time, in point of value they were centuries apart, and, based as they were upon individual observations without much reference to the past, they marked a distinct, separate, almost abrupt era in the history of the disease. The observations of Bayle regarding the nature of tubercles and the discoveries of Laënnec regarding the diagnosis of the disease did not seem to be based upon previous investigations, and hence are not gradual evolutions of previous views. The work of each was almost wholly original, so that their disclosures brought about a revolution in the study of the disease. Bayle in 1803 began his work with the distinct recognition of miliary tubercles, which he was the first thus to name. The larger forms, which attain the size of chestnuts, soften in their centers and are finally destroyed by suppuration. Translucent granulations the size of millet seeds and cartilaginous consistence, hence different from miliary tubercles, which are gray and opaque, produce the same ulcerations in underlying tissues, encountering the same structures in almost every organ of the body, especially in the larynx and trachea. He was not content to look upon them as accidents or curiosities. He saw in them the same characteristics and considered them as the real deposits of the same disease. The disease was therefore a general affection with various local expressions. Cachexia, a diathesis which he distinctly named the tuberculous, a diseased condition specific in its nature and independent of inflammation of the glands of the lymphatic system. Tuberculous phthisis is therefore not a disease produced by inflammation of the lungs, pleura, or bronchi. These affections may complicate it or precipitate a fatal end.

In these sentences are summed up a knowledge of the specific nature of tuberculosis, its distinct isolation from all other affections, and its existence as an independent disease. Had the succeeding pathologist been content to stand by the disclosures of Bayle, our present knowledge of the pathology of the disease might have been advanced a half a century.

The age of Laënnec has now arrived (1819). Bayle had described what might be called the dead facts of the disease; he had shown what tuberculosis really is.

An individual is affected with tuberculosis as soon as tubercles are present in the lungs. Bayle knew of no signs, however, by which the presence of the tubercles was detected in life. Not until pus was expectorated and hectic fever had set in could the disease be distinguished as yet, consequently Bayle took a hopeless view of the disease. Laënnec, on the other hand, discovered signs by which the presence of tubercles could be detected early in the complaint, and his view of the prognosis was far from encouraging. Laënnec commenced his work at the foundation. He began his work with the study of tubercles. He discussed his subject throughout from a clinical standpoint, paying close attention to all abnormal conditions of the breast. The fame of Laënnec rests, however, more especially and indisputably upon the discovery of auscultation, which at once outranked in value all other means of investigation. Auscultation is said to have been the creation of Laënnec, but percussion, which is also valuable in determining the condition of parts contained in the chest, was practiced since the time of Hippocrates.

Little was done with regard to the investigation of this disease from the early part of the century until about the middle of it, when Rokitansky, in 1842, taught that tuberculosis was the result of an exudation of coagulated albuminous compounds. A little later, Addison thought it originated from the white blood corpuscles. Lebert, about the same time, found a microscopical formation (neoplasm) which he believed was the sole cause of the disease. In 1847, Rheinhert fell back upon the old idea that tuberculosis was the result of chronic pneumonia. These theories were all eclipsed, however, by the famous Virchow, who, from his enviable rank and reputation as a scientist, had great weight in overthrowing all theories which had been advanced previous to his time, and his influence caused others to soon fall into his way of thinking. He declared that tuberculosis was a cheesy metamorphysis (change) resulting from an improper admixture of the blood which had previously been contaminated with different matters and which are apparently necessary to produce the peculiar condition. He also argued that tuberculosis had never been produced in animals experimentally and that it was never known in the fœtus. He also taught that it was hereditary, not by disease, however, but by disposition, and established the thought that youth was the age, above all others, when the individual might be considered as prone to the disorder. He studied the disease in quite an extended manner and recommended lines of treatment which became very popular, as they were thought to have a baneful effect upon the cause of the disease, and, in some instances, appeared to work a miraculous cure. Among other things, codliver oil became a very fashionable medicine with persons who were relapsing into a decline. Change of climate and a nutritious, easily digested food were also highly recommended by this savant, and his patients were warned against exposing themselves to influences through which they would be likely to take cold. He advanced his theories with such force, that they captured, so to speak, many eminent physicians.

Following him, came his pupil, Neimeyer, who was an enthusiastic exponent of his teacher's views. He, however, opposed heredity as being the cause of the complaint, but also admitted that the offspring of consumptive parents were likely to be affected with the disease. The congenital phase of the question, however, had not come up for discussion in this school.

Schroder Van Derkolk announced about this time that he was able to detect tuberculosis in the sputem by the presence of certain pus of an elastic nature.

Up to this time investigations had not been carried on, extensively at all events, with regard to the communicability of the disease from man to man, or even from man to the lower animals, notwithstanding that Laënnec accidentally inoculated himself in the finger while making a post mortem, which is reported to have disappeared, however, after frequent cauterizations, the first scientific investigations with regard to the communicability of the disease were pursued by the distinguished Villemin, who was the first to demonstrate that tuberculosis could be transmitted from man to animals. He inoculated rabbits and other animals subcutaneously and otherwise with tubercular matter derived from the miliary nodules and caseous tumors and even pustular products, and obtained identical results, thus showing a common cause in the production of various forms of the disease. These results were of such importance that they caused a radical departure from the then accepted views regarding the nature of this complaint, and were not accepted until the bitterest opponents of the theory were literally forced to accept the version of Villemin's results as being correct, and it is pleasing to note that these opponents eventually became the most loyal adherents to the new view and supported Villemin's work with considerable emphasis.

It was not long before such celebrated veterinarians as Chauvean (in 1868) took up the work and experimented upon ordinary domestic animals, including calves, sheep, hogs, dogs, and last but not least, horses. besides some of the smaller creatures, which were also affected.

The experiments concerning the communicability of this disease have been repeated and verified so often that it seems unnecessary for me to dwell upon that phase of the question. Were it deemed advisable, the most convincing experimental evidence could be produced here concerning the communicability of this disorder in various ways. In every-day life we have abundant, convincing proof reported, as clinical or bedside evidences of the communicability of tuberculosis. And statistical information convinces us in a most positive way that the disorder is spread from man to man and from man to animal, and *vice versa*, while personal observation has with equal force convinced the writer that it will spread through a herd of cattle in due time, providing the conditions are favorable.

After the contagious theory of this disease became established by scientific investigators, the ambitious ones soon began a search for the true cause of the peculiar material which produces such a disastrous effect upon the animal economy, but the progress of the investigation was rather slow, and it took about a decade before much advancement was made.

In 1878 Dr. Tapplin caused dogs to inhale powder produced by drying the sputum of consumptives, and he succeeded in producing the disease in some of the animals which he experimented upon.

In 1880 Conheim inoculated animals in the eye with tubercular virus and was able to note the progress of its growth, and after trying to produce similar effects with materials that were believed by many to be foreign to tuberculous matter, he eventually said, so far as tuberculosis is concerned: "Everything depends upon the virus, but the disease is still a riddle unsolved."

Klebbs in 1878, on investigating the disorder from the bacteriological standpoint, contended that he had isolated a micrococcus, but this was not proven to be the cause of the disorder in a manner that science could accept it.

In 1881, a bacillus as well as a micrococcus were blamed for causing the disorder, but the investigator was not sufficiently clear as to his methods to cause his assertions to be accepted by the bacteriological workers of the day, and it remained for the far-famed village physician of Germany, Dr. Robert Koch, to demonstrate to the world that he had made the greatest discovery of modern science, and his investigations, as has been already stated, were given to the world by the exposition of his classical treatise upon the subject in March, 1882.

With the foregoing brief sketch it may be well to close the history of this interesting complaint and pass on to some of its more practical features.

THE CAUSE.

The cause of tuberculosis has been shown to be a microscopic object called the Koch bacillus of tuberculosis, which has been most extensively studied by the far-famed professor, Robert Koch, in honor of whom the germ was named. He announced his discovery of the cause of this disease to the scientific world at Berlin in March, 1882, through a classical treatise upon the ætiology of tuberculosis, in which he showed the most extended and thorough study of the question. Since that time the micro-organism, which was claimed by Koch to be the sole factor in the production of this disease, has been studied by an army of workers in bacteriology, and although his statements were opposed by some, yet the opponents of his theory crumbled away one by one, until today it is questionable if there is an advanced bacteriologist who will dispute Koch's theory of the cause of the disease.

DISSEMINATION OF THE VIRUS.

In the present light of our knowledge of the cause of this disease it appears evident that the sources of infection demand close attention, for how can we ever hope to fulfill the prophecy of that savant, Pasteur, who has immortalized himself by his work, and who says in his discussions upon the cause of such diseases. "Man has it in his power to cause parasitic diseases to disappear off the surface of the globe, if, as we firmly believe, the doctrine of spontaneous generation is a delusion," if we do not block the avenues through which the virus gains access to the economy?

The avenues of infection open from various sources. First amongst them, let me speak of the sanitary surroundings of some of our most carefully guarded stock, for though singular as it may appear, it is amongst this class of animals that we oftenest meet with the disease, because they are housed in the most comfortable quarters, too often without sufficient sunlight or ventilation, and even when ventilation is permitted in all reasonable quantity, the greatest care is taken to prevent anything like a draught. The fresh air is required to come in on its tip toes, as it were, keep very quiet, and make its exit as quietly as it came in. As for sunlight, it is probable that it never gets into many cow stables directly, especially in those cases where the compartment is on the north side of the building. When the stable is more favorably situated, the windows may be small and too often covered with cobwebs or dust, or both. As far as our experience has gone, pure sunlight in a cow stable is usually the last thing thought of from a sanitary point of view.

It is well known to bacteriologists that direct sunlight has a most baneful effect upon the bacillus of tuberculosis, hence the advisability of having the stable so situated and arranged that the sun may have its full sway at all times. Indeed, the sunlight will not only have a baneful effect upon the germs of this disease, but it will have a salutary effect upon the constitutions of animals which are housed for lengthy periods, as they often are in northern latitudes.

Place a cow in the early stage of tuberculosis in a stable poorly lighted and indifferently ventilated, with a number of healthy cows. Under such conditions the diseased cow will most likely get worse, and will scatter the germs of her complaint right and left with her various excretions. This being of a contagious nature, is it to be wondered at that the other cattle will in time contract the disorder? It may take some time to develop the complaint in this way, but in the long winter months of our latitude valuable cattle are often housed, perhaps, more than is good for them, and there would be ample time as well as opportunity to contract the disorder. Looking then upon environment as an avenue of infection, it is hardly necessary to add that it may be blocked to a large extent by observing strict hygienic principles and keeping healthy and unhealthy animals separate from one another.

MANIPULATION OF THE FOOD AN AVENUE OF INFECTION.

In some well regulated establishments the food is occasionally handled in such a manner that it becomes an excellent vehicle for disseminating the disease, to wit: The cattle are all fed a certain amount of a certain ration at stated periods every day, and it often happens that one or two of them (varying as to individuals from day to day) will not eat it all up; that which remains is taken from the manger at a certain time after feeding and placed in a pile, where it is mixed with the next general ration to be fed out again at the next feeding hour, indiscriminately to one or all of the animals, and thus the disease may be handed in the most unsuspected manner from one cow to another. In this way valuable cows may be literally killed through mistaken economy by being required to eat such food as has been showered upon with disease-bearing sputum from their afflicted stable mates, and from one cow it gradually spreads through a large percentage, if not the entire herd.

Another avenue of infection, especially in the young, is the milk, for this may contain the germs of the disease in considerable numbers and yet the udder not be affected. This has been proven by numerous investigators, including Ernst of Boston, Smith & Kilbourne of the Bureau of Animal Industry, and a host of others too numerous to mention. Some are even alarming in their denunciation of milk as a source of tuberculosis amongst children. Prof. Law quotes Dr. Shakespear as saying "that one-fifth of all the diseases of infants and young children fed upon milk is due to tuberculosis." To help to determine the influence of diseased milk upon the animal economy, I have recently closed an experiment which indicates that it will produce disastrous results under favorable conditions. The details of the experiment will be published in a bulletin from the Michigan Experiment Station at an early date. Suffice it to say here that twenty gallons of milk were artificially infected with the germs of tuberculosis. This batch of milk was fed to three hogs for a period of four days, when it was all consumed. These hogs were placed in what I supposed to be a healthy pen. Immediately next to them, with only a board partition between, three other hogs were placed as controls. The latter three received the same general treatment as the former trio, but they did not get any of the diseased milk. After the four days had expired, the six animals were treated alike in every respect, as nearly as possible, the same man feeding them the same ration from day to day for several months. At a convenient time two of the three animals which were fed the diseased milk were slaughtered, and post mortum examination revealed general tuberculosis in both animals, the third one being kept alive for further study. The three controls were killed at the same time, and the most careful and rigid examination by Mr. C. E. Marshall and myself of all parts likely to be infected with the disease failed to discover a single suspicious lesion, and were consequently regarded by me as healthy animals. This experiment indicates that infected milk is dangerous, although only consumed a few times. It is, perhaps, unfortunate, as far as milk is concerned, that in the early stage of bacteriological investigations of this disease it was thought that as long as the udder was healthy the milk was safe, but we have volumes of experimental evidence at this time showing the contrary to be true, in other words, that the milk of a cow affected with tuberculosis may spread the disease to animals which partake of it, although the milk gland itself may not show evidence of disease. This suggests the advisability of Pasteurizing or sterilizing all suspected milk, if not all milk. Another avenue of infection comes through cattle licking their diseased stable mates, over which the diseased sputum of this disorder may be more or less distributed. When the disease comes through the avenue just suggested, the digestive organs and lymphatic system are oftenest affected. We frequently meet with this disease as affecting the lungs of cattle, and observation has led us to believe that the avenue of infection in these cases was through the air chambers, probably by inhaling dust from a recently-swept stable floor, or the dust of fodder which has been showered upon by cattle previously affected with the disease, or even the dried expectorations of a consumptive attendant. The fluid upon this fodder being permitted to dry by natural or ordinary circumstances, it is in a fit state to be inhaled when cattle toss it about with their muzzles, as they frequently do when searching for the more delicate morsels in the ration. Numerous intelligent breeders believe that bovine tuberculosis is hereditary, and even many scientists in their writings are not at all clear upon this phase of the disease. The confusion of the terms hereditary and congenital are no doubt responsible for our being sometimes misled as to these avenues of transmission. Even Fraenkel (p. 245), in his classical text-book upon bacteriology, if he is correctly translated by Linsley, mixes these terms in such a manner that if we are to accept his statements the germ theory of bovine tuberculosis is undermined, and, to use his own words, "at once falls to the ground." It is true that the author does not admit that tuberculosis may be an inherited disease, on the contrary he insists that it is not; though he does not undertake to prove it in his description of the disorder to which I have taken the liberty of referring.

For my own part, I believe that tuberculosis never was hereditary, is not now, and never will be. To demonstrate the grounds for this position we must first of all draw sharp lines between the meaning of the words *congenital* and *hereditary*, then we must go back to the very derivations of the terms and trace them step by step, until, figuratively speaking, we find the disease manifesting itself through symptoms in the living animal. The word congenital, according to the Etymological Dictionary by the Rev. W. W. Skeat, professor of Anglo-Saxon in the University of Cambridge, England, is derived from the Latin word *congenitus*, meaning *born with*. According to the Medical Dictionary of Dunglison, M. D., L. L. D., late professor of medicine and medical jurisprudence in the Jefferson Medical College of Philadelphia, it means *begotten with*, and here let me say that some importance of passing interest may be attached to the different meanings of the word given to it by the different authors. When, may I ask, is a creature begotten? or when is it born? If the solution of the problem were left to the writer, it would be said that a creature is begotten as soon as the spermatozöon of the male unites with the ovum of the female, and the process of reproduction commences; while the creature is born when it is brought into the outside world and breathes free oxygen; when, in the language of the bacteriologist, it becomes an obligative aërobe.

Now we may trace congenital tuberculosis in the mother to the ovaries and in the sire to the testes. The ovaries being the seat of the disease, it is not difficult to imagine the minute bacillus insinuating itself into the Graafian vesicle, and when the latter bursts at the time of menstruation the germ may easily be carried with the ovum into the fallopian tube, or womb itself; and in one or the other of these places and in company with the ovum, unites with a spermatozoon from the male, and if conditions are favorable the germ multiplies, while the new creature steadily grows, so that when the being is born it may at that time be already affected with the disease. That form of the complaint we interpret as congenital tuberculosis coming from the mother. On the other hand the testes of the male may be affected with the disease, so that when the minute bacilli of tuberculosis are liberated in them they may be readily carried by the spermatozoa, which are giants in comparative size, into the generative organs of the female, and there meeting with the ovule, the new (begotten) creature is inoculated, this time, though, from the male fruit of impregnation; constituting congenital tuberculosis coming from the sire. In this case the mother may give birth to her offspring laden with the germs of disease without ever having a vestige of the same complaint herself. We may go even beyond this, and trace bovine tuberculosis, or rather the germ of it, from the floor of the cow stable, carried up by the dust into the lungs, from an accidentally abraded surface of which it gains access to the current of blood, through which it is conveyed to the ovaries, or testes as the case may be, where under favorable conditions the evil consequences follow; and we have a well-developed case of congenital tuberculosis in the calf. In this instance might not the hereditarian say, upon finding the sire and dame healthy, "Here is a case where the disease has skipped a generation, or two if necessary, and through atavism or heredity the old family complaint has come to life again," when really the disease might have come from another animal of a different breed or race. To revert somewhat briefly to the word hereditary, let me say that it is derived from a Latin noun, *heres*, meaning an heir, the genitive case being used and suffix added to make up the word; it then evolves, when somewhat liberally translated, into the phase "pertaining to the heir of." Gould, in his famous dictionary of Biology and Allied Sciences, says it means "acquired by inheritance," and speaks of it as the transmission of physical or mental qualities or tendencies from parent to offspring, while the same author, in quoting Darwin's Theory of Heredity, supports the suggestion that each of the cells of the body gives off germinal particles, these when grouped constitute the generative cell, which in its turn is endowed with an inherent power to reproduce itself as well as the peculiarities of the original organism. But the Koch *bacillus* is an accidental invader of the cell of the economy; it is consequently a foreign body, just as much as a fine splinter of wood would be under certain circumstances, and has nothing whatever to do with the original constitution of that cell, therefore tuberculosis cannot be an hereditary disease. Another avenue of infection suggested by some is the placenta or after birth, it being contended that these membranes becoming affected from the mother are liable to communicate the disease to the young creature in utero, but looking at it from an anatomical standpoint, we are forced to the opinion that the placenta is far more likely to be infected from the fœtus (creature before it is born) than the fœtus from the placenta, for we must remember that the blood of the mother does not at any time come directly in contact or mingle with the blood of the fœtus, but that there are no less than two membranes to be penetrated, the wall of the blood vessel of the mother and the wall of the blood vessel of the placenta, before the germ can be conveyed to the fœtus in this way; while the communication from the fœtus to the placenta through the umbilical vessels is uninterrupted and continuous. We do not wish to infer, however, that the former method of infection is impossible or even improbable. By way of experiment, the blood has been shown to be an avenue of infection under what might, perhaps, be regarded as strained conditions; that is to say, the blood has been taken from the heart of an animal affected with general tuberculosis and injected into another susceptible animal. In the course of time the injected animal has broken down with tuberculosis.

As pointed out by many writers, wounds caused by mechanical appliances which are smeared with the germs of the disease and not thoroughly sterilized before being used, are responsible for some of the most unhappy results, some of which are noticed in another part of this report.

THE BREED OF CATTLE MOST LIKELY TO BE AFFECTED WITH TUBERCULOSIS.

An experience of over twenty years as a practicing veterinarian has led me to the conclusion that one breed of cattle is just as likely to be affected as another, and in my opinion very great injustice is often done to some, especially the Jersey, by the statement that they are more prone to tuberculosis than other breeds. This will be shown more clearly when I come to describe the tuberculin test, as I have applied it in this State. I have now under observation twelve head of cattle affected with tuberculosis composed of one Holstein, three Shorthorns, two Guernseys, onepolled Angus, three native grades and two Jerseys. Other breeds were not extensively represented in the herd from which the above were taken. I have seen it in the rugged Galloway, the Ayershire, the Hereford and many kinds of grades. The reason why I have not seen it in other breeds is probably because I have not had an extensive experience with them. I am firmly of the opinion that proper handling of cattle has more to do with their resistance against the germ of the disease than has the breed. This phase of the question may be discussed under the head of

INDIRECT CAUSES OF TUBERCULOSIS.

While it is now universally conceded that tuberculosis is due to a certain bacillus and without which the disease cannot exist, yet we must not ignore the fact that a weakened condition of the animal economy is favorable to the development of the germ, as the cells of the body have, to a greater or less extent, lost their power to fight against or resist invading germs, consequently the balance of power swings to their side, and, figuratively speaking, they sweep all before them. Again a weakened constitution seems to be a suitable soil or habitat for germs to grow in, and even the most superficial study of the question will readily convince us that suitable soil is just as necessary for the growth of disease producing germs, as it is for wheat germs or other familiar vegetable productions.

ILL-HEALTH AS A FACTOR IN THE INDIRECT CAUSE OF TUBERCULOSIS.

As far back as the year 1777 we find William Cullen saying that small-pox and measles often lay the foundation for tuberculosis, while there are few practitioners today but will admit that the debilitating influence of other diseases, acute or chronic, as the case may be, is often followed with an attack of consumption (tuberculosis). How often we are told on inquiring into the history of an individual case, that the animal had recently come a journey by freight and caught cold *en route*, or that it had more or less recently been exposed to a cold rain and chilled by it. I have often noticed the disease following closely upon the heels of parturition, while in other cases an acute bowel trouble may be the forerunner of the more serious complaint.

INBREEDING

is thought by many to be the indirect cause of tuberculosis; and, while I am ready to admit that under some circumstances it may be, yet I am still of the opinion that inbreeding from rugged and healthy animals will not produce offspring, on the average which may be regarded as being prone to tuberculosis. On the other hand, I am ready to admit that in inbreeding from parents with weak constitutions may result in the production of offspring which may be peculiarly susceptible to the disease.

BREEDING TOO YOUNG.

I am often asked the question by farmers and others if it is a dangerous practice to breed at too early an age, and invariably reply that I am of the opinion that it is not judicious, to say the least, to breed before the animal has come to maturity, for the reason that I believe it is asking too much of nature to develop two healthy creatures from the same economy at the same time. Such a practice would, in my opinion, if carried to the extreme, undermine the constitution of the mother in such a way that, if not disease, early decay would be the result.

IMPROPER AIR.

At one time air rendered impure by the breath of other animals was looked upon as being favorable to the propagation of tuberculosis, and it was thought by some to be the cause of the disorder. While it is certain that this cannot produce the disease at all, in the absence of the germ, yet it is such a potent accessory cause, when the bacillus is present, that its importance cannot be too highly appreciated. I have had this illustrated over and over again in this State where animals have been required, through mistaken kindness, to breath the vitiated air of warm stables in which they were housed to keep them comfortable in the cold days of a long winter.

DARK STALLS.

In very many instances we find dark and ill-ventilated stables going hand in hand. Such buildings are frequently filthy as far as their general surroundings are concerned. The darkness and filth, accompanied with foul air, is a good place for the development of the organism which causes this disorder. Besides being a favorable place for the development of the organism when it is present, the dark stalls which cattle are kept in month after month, will produce a change upon their economy which will debilitate them, having, it is believed by many, a direct action upon the blood globules which are influenced in such a way that they do not carry oxygen to all parts of the body in sufficient quantity to keep it in robust health; consequently we have a weakened constitution, prone to tuberculosis, in this case from the badly lighted or dark stable.

INSUFFICIENT OR UNWHOLESOME FOOD.

It is almost unnecessary to say that lack of food will debilitate the constitution of an animal and that indigestible or in-nutritious food will act in a similar manner; which may account for the half-starved creature being so often the victim of this disease. On the other hand, those animals which are fed on highly nutritious food, forced as it were, are also debilitated from a kind of indigestion, the result of food containing too much nutritious matter, more in fact than the body of the creature can assimilate or convert into the tissues forming its various organs, and in this way, we believe, the animal becomes within certain limits debilitated.

Overtaxing is thought by some to produce a certain degree of debility, such for instance as is sometimes resorted to in the dairy where the desire is to produce a record-breaking animal. Indeed the almost incessent strain upon the animal in such a case seems a feasible way to account for the presence of the disease in some of our most robust animals.

SYMPTOMS.

It is most unfortunate that this disease invades the economy of the animal in such a subtle manner that in many instances it has made extensive inroads upon the constitution before any extraordinary deviation from health is noticed. Recent experience has shown us that it makes considerable difference which avenue of infection the germs take to produce certain clinical symptoms by which it can be diagnosed, though clinical symptoms even in these cases must be accepted with some reserve, until figuratively speaking, there is time to run the material through the bacteriological mill. The writer's attention has more than once been called to cases diagnosed as tuberculosis in which microscopical examination, as well as other bacteriological methods showed the diseased condition to be the result of another cause. Sometimes the disease manifests itself in the beginning by an acute attack of diarrhœa which often appears considerably better after judicious treatment, when we are liable to congratulate ourselves that the case is doing nicely, only to be disappointed when some apparently trivial cause brings on a second and more acute attack. Things may go along in this unsatisfactory manner for some time, when sooner or later, the characteristic consumption begins, and the case goes from bad to worse and finally dies, an emaciated looking object. A case like the above is more likely to have derived its poison from the food, such as milk contaminated with the bacilli, or grass upon which these germs have been profusely showered with the discharges of an affected animal.

But the disease does not always take this rapid course through the alimentary canal. During the past year I have held post mortem examinations upon animal after animal and found a vast preponderance of the diseased lesions in the glandular or lymphatic system, which is the intermediate channel between the food and the blood, indicating that the germs found access to the body again through the food, but apparently finding a suitable habitat in this system seemed to be resting quietly while the host in its turn was growing fat. Indeed, it was difficult for me to form an opinion in many instances whether the animal would die from the disease or old age, if left to take its own course. No doubt such animals are the most dangerous to have about, for they may spread the germs right and left without ever being suspected of having the disease themselves, because they do not show symptoms by which it can be recognized through any known physical examination. Bacteriological examination might discover it, but in ordinary veterinary practice that would not be likely to be made. When the disease invades the economy through the organs of respiration by inhalation of bacilli which are floating in the disturbed air of say, a recently swept compartment, the floor of which has been bespattered with the discharges of a diseased animal, and allowed to dry, a very different state of affairs may be manifested. The germ, finding an abraded surface upon the lining of air tubes of the lungs, will very likely lodge there and form a colony which, in its turn, will in time, break up and scatter, forming many more colonies in the same lung or other parts; and this sort of thing may go on until there is enough of these foreign elements in the lungs to irritate them. Then the cough begins, followed sooner or later by loss of flesh. Nothing the animal eats seems to do it any good; in fact it loses weight from day to day, typical consumption having set in which only needs time to wipe out the existence of the creature.

All the living or organic tissues of the body are liable to be affected with this disorder and of course the symptoms vary somewhat according to the organ or part affected. When the brain, for instance, is the seat of the attack then a variety of nervous symptoms will manifest themselves according to the part of that organ affected. If, for instance, the part supplying vision becomes diseased, then paralysis of the nerve of special sense of sight may be brought about and the animal become blind. In a similar manner the animal may become deaf, or the sense of taste or smell may be deranged. In other instances that part of the brain which controls the voluntary movements of the body becomes affected and the creature moves about, if it moves at all, in the most eccentric manner; truly it is unbalanced. When any part of the spinal cord becomes affected the symptoms vary from partial to complete loss of motion or loss of sensation, or both. When the generative organs of the female become involved to a very large extent she will not breed with certainty. I have seen cases where the womb was so distorted by disease that it could hardly be recognized. Indeed, the same might be said of any other organ in the body.

Again, tuberculosis appears under two heads—the acute and the chronic. The first may run its course in an incredibly short time and is then spoken of as galloping consumption, and even the chronic variety will sometimes become suddenly acute, when the closing scene of the disease approaches with extraordinary rapidity, after perhaps a lingering illness of many months or even years. At the outset of the disease, either acute or chronic, the lesions may be confined to one organ or region of the body, therefore the symptoms vary considerably. In many chronic cases the tubercules are confined to such parts as the liver, spleen, pancreas or lymphatic glands; in which case the animal may live and thrive for an indefinite period.

One of the most remarkable cases of this description was brought to my notice upwards of twenty years ago, a history of which may prove of interest to many, and serve as an example of how the disease may and does behave itself. The history was as follows:

An animal in a high class shorthorn herd, which I had under my veterinary supervision, one day refused her feed and coughed a little. The foreman of the establishment reported the case to me forthwith. I visited the creature and after making an ordinary physical examination of her, suggested to the man that she might have taken cold and treated her accordingly. The following day I visited her again and upon making further examination of her condition was somewhat surprised to find evidence of heart disease. She being in very high condition, I thought possibly I had a case of fatty degeneration of that organ to deal with. But that did not account for the cough which was of a most intractable nature; so I stated to the owner that I was afraid his animal was affected with consumption, and advised him to dispose of her before much expense had been consumed in treatment, which I was afraid would be of little, if any avail. He stated that the cow was a very valuable animal, worth many hundreds of dollars on account of her pedigree, but added that he would act according to my recommendation. I said to him perhaps it would be better to wait for a few days, in case I might be mistaken, and as far as I could see, there was no immediate hurry in the case. This being agreed to, I kept a close watch upon the creature for about a week or ten days, during which time I could not see that there was any abatement in the symptoms. It may be here remarked that this case occurred many years before the true nature of this disease was known. I mention this because today I would almost regard the recommendation I made as being criminal, to-wit: I stated to the owner after the ten days had expired that I thought it would be more profitable for him to kill the animal and sell his carcass for beef. He requested me to so direct his foreman, which I did, and further requested him to preserve the heart and lungs and various offal. To make a long story short, in the course of two or three days, the foreman reported to me that he had preserved the lungs and other offal for my inspection, but that he could not find the heart. Although I was at first surprised at his statement, yet when I came to examine the parts I was not, for the entire pericardial sack was a mass of tubercular matter, enveloping the heart in such a manner that no layman would ever suspect the presence or existence of that organ from external appearances. The tubercular matter formed a case around the heart, the walls of which were at least two or three inches thick on the average. When cut down upon this case was composed of the cheesy matter so characteristic of long standing tuberculosis. This condition of things readily accounted for the symptoms of heart disease, which I recognized the day after my first examination, and to which I have already alluded. Besides this there were groups of miliary tubercules in every direction about the lungs, which organs were also the seat of extensive disease. Passing out of the chest and reaching that cavity which contains the bowels and kidneys I found these organs also badly affected. The space usually occupied by what the housewife calls the suet, was nothing but a mass of tubercules and the glands of the bowels were very seriously affected with the same disease. Indeed, this was such an advanced stage of general tuberculosis that I began to doubt whether I had received an accurate history of the case from the foreman, and proceeded to question him somewhat closely as to how long the cow had been ailing before she was reported to me. I was assured most positively by him that the animal had never refused a feed in her life until the day she was reported to me. Knowing how particular they were on this farm to have all cases of disease reported at my headquarters as soon as they manifested themselves by symptoms, I had no doubt but that the truth was told. Since that time I have met with many cases similar, though perhaps not as bad as the above, which have convinced me most emphatically that tuberculosis can invade the economy of an animal most extensively and yet the disease cannot be diagnosed by physical examination. During the past two years I have had this conviction very firmly substantiated through the application of the tuberculin test, where I have found scores and scores of the most vigorous, sleek, and healthy looking animals loaded with pounds and pounds of advanced tubercular matter. I mention this at this time to impress upon the reader the value and importance of the tuberculin test, to be described later.

We will now pass on to the symptoms of the disease when it attacks individual organs.

TUBERCULOSIS OF THE LUNGS.

The disease may attack these organs in the acute or chronic form. When the acute form occurs the animal may be noticed to be off its feed, its coat will stare, the skin will appear hide-bound, it will be tucked up, more or less, in the flank, refuse to eat even the most delicate morsels, will breathe with more or less rapidity; cough is usually present and can be often excited upon slightest provocation. Percussion upon the walls of the chest will cause the animal to evince more or less inconvenience. The eyes may be sunken and a profuse discharge of tears may emanate from them. General prostration is a usual accompaniment of the disorder in these cases, and the animal becomes much debilitated in consequence.

Things go from bad to worse until in the course of a few days she will appear an abject, loathsome looking object, staggering in her gait and ready to fall at any moment. The tottering gait is a common signal of the approach of the closing scene of the disease, and nature usually puts an end to the unfortunate creature's sufferings within a few hours. As far as my experience has gone the acute form is rather the exception than the rule. In the chronic form the disorder is insidious in its progress. The appetite will often be capricious, the animal partaking somewhat lustily of her food one day and refusing it perhaps altogether, or eat it daintily the next. She will give an occasional cough which is not unusually regarded as being of a serious nature, and may be accounted for by the herdsman saying "Some dust has gotten into her throat," or something of that kind. If we were fortunate enough to collect some of the sputum during these paroxysms of coughing we might be able to diagnose the disease positively with the aid of microscope. I have done so on some occasions by finding the germ. But we must not allow ourselves to be misled by such an examination, because our inability to find the germ does not prove that it does not exist in the economy of the animal, while its presence does prove the existence of the disease. As time progresses the cow may not thrive as well as its neighbors although even at this advanced stage of the disease the symptoms are still negative. Later on, however, the cough will appear to be getting worse and the herdsman is likely to say that such and such a cow "catches cold on the slightest provocation," because for two or three days she will appear as if suffering from an acute cold, when, in the course of time, the atmosphere and other surroundings being conducive to good health she will appear better, but again relapse into her former unsatisfactory condition upon the slightest provocation. After a time, as the disease becomes still farther advanced, more positive symptoms present themselves. The cough gets worse, her breath frequently has a foul odor; she cannot endure fatigue in the shape of driving to the pasture field, for instance; her appetite becomes more and more capricious and dainty; she will soon begin to shrink—typical consumption having set in, when she will go down and down, and eventually die an emaciated, pitiable looking object.

During the progress of the disease through the lungs, the human physician in his practice, has the advantage of being able to determine, even in the earlier stages of the complaint, that something is radically wrong with them, and the impressions which are conveyed to his ear through auscultation are so characteristic of tuberculosis that he can diagnose it with reasonable, though not by any means positive, certainty. But the veterinarian is handicapped in many ways, so that to him auscultation is not of nearly so much benefit in diagnosing this disorder. In the first place, the difficulty of keeping the animal quiet while the operation is being performed, then the thick skin, or thick muscles, and often the thick layers of fat will prevent his ear from detecting certain sounds or rather the absence of certain sounds. Again, the rumbling of gas in the bowels and rumen will often defeat his efforts. But supposing he does determine that the lungs are diseased? Experience has no doubt taught him that he is not justified in proclaiming it a case of tuberculosis at once, for we have other disorders which produce similar ante-mortem symptoms, notably actinomycosis, parasites in the lungs, or chronic pneumonia, with perhaps other conditions which I have not investigated.

In the chonic form of tuberculosis of the lungs, the eyes assume the same general appearance that they do in the acute form, that is to say, they present a glassy appearance, they are sunken into the orbital sockets, and frequently surrounded with a profuse discharge of tears, giving them what is commonly called a watery look.

TUBERCULOSIS OF THE HEART.

While the muscular tissue of the heart itself is not often involved in tuberculosis, so far as my experience has gone, yet the membrane (pericardium) covering it is occasionally attacked. Of course the symptoms are more or less remote, and at best are not diagnostic. All that we can say in cases of this kind is that the intermittent pulse is indicative of disturbance of this organ, while the inability of the animal to stand fatigue without some good reason, might perhaps, still further arouse our suspicions as to heart disease. This occurring in a herd sprinkled with the complaint, we might naturally regard the deviation from health as being alarmingly suspicious, to say the least of it.

TUBERCULOSIS OF THE STOMACH.

In cases of this description the organ may in some cases be able to perform its function fairly well, but in such a complex organ as the stomach of the ox, it is more or less difficult to describe the disorder in a manner that would be comprehended by the average reader. Certain characteristic features, however, do accompany the disease which suggest to the ordinary observer, that the stomach was affected with some occult disease. In many animals the appetite becomes impaired, evidenced by its irregularity, rumination is not performed in a satisfactory manner and the herdsman may complain that such and such an animal loses her cud frequently. When the first compartment of the stomach, namely the rumen, is affected, the cow will in all probability, be a victim to tympanites and, as a consequence will bloat upon almost any kind of food. If the fourth compartment or true digestive portion is affected the symptoms will vary according to the severity of the attack and in extreme cases the animal may be afflicted with exasperating pains, but in cases of this description the symptoms are surrounded with so much uncertainty that it is accepting a good deal of responsibility, and perhaps jeopardizing one's professional reputation to diagnose tuberculosis of the fourth stomach in anything like a positive manner, without the aid of tuberculin.

When the bowels and their associated glands are diseased, the symptoms are well marked and even regarded by many as diagnostic, that is to say, the animal will be affected with a disturbed condition of these organs, frequently breaking down into an acute attack of diarrhœa. This will yield to treatment at times, but will return with increased severity on slight provocation, which second attack cannot be overcome. In the case of valuable animals, careful feeding with judicious management will keep the disease in abeyance for a considerable length of time. But notwithstanding this, the progress of the disorder will, as a rule, keep making dire inroads upon the constitution, until the army of invading germs hold the balance of power firmly in their clutches. When this state of things has been reached it does not take long to decide the battle, the afflicted creature will run down very rapidly, and like her neighbor who was perhaps, affected with the disease in her lungs, will die a loathsome, emaciated looking object. A case like this is technically called tabes mesenterica.

TUBERCULOSIS OF THE ACCESSORY ORGANS OF DIGESTION—LIVER, SPLEEN, PANCREAS.

The liver of animals, as far as my experience has gone, is oftener affected with tuberculosis than either of the other accessory organs of digestion. I have seen it quite badly diseased without being able to recognize the complaint ante-mortem. In some instances the disturbed condition of this gland will manifest itself by such symptoms as an occasional attack of jaundice and certain indefinite symptoms of ill-health will often accompany the disorder.

The pancreas and spleen are occasionally affected, but the symptoms which they produce, if, indeed, they produce any at all, are so obscure that I have not been able to recognize the deviation from health which would point to their being affected with this complaint. It is as a rule only when the disorder is generalized that these organs are affected; at least, that has been my experience; but it must be added that it has only been on post-mortem examination that I have discovered them diseased.

TUBERCULOSIS OF THE KIDNEYS.

Tuberculosis of the kidneys may in aggravated cases produce distressing symptoms; the loins may be sensitive, and manipulation of them will cause the animal to evince considerable pain, pinching or pressure upon them causing the creature to wince in an irritated manner. The discharges from the glands may be frequently discolored or mixed with blood or matter or both. Microscopical examination of the discharge may reveal the presence of the bacilli of tuberculosis and thus a positive diagnosis of the complaint may be made.

TUBERCULOSIS OF THE LYMPHATIC SYSTEM.

Tuberculosis of the lymphatic system is very often unsatisfactory from a variety of standpoints. In the first place it is not always easy to diagnose it, while in other instances, when we do diagnose it, the treatment is most unsatisfactory, but notwithstanding, we should make ourselves acquainted with the symptoms of the disorder when affecting this system. I have found glands at the root of the ear swollen to a considerable extent and upon removing them they were loaded with the caseous matter of tuberculosis. The submaxillary glands, situated behind the branches of the lower jaw, and about the angle of the same, are difficult to feel when healthy, but when affected with tuberculosis they swell up to a greater or less extent and sometimes burst, or if cut down upon will be found containing cheesy material. In cases of this description the disease may be easily confounded with actinomycosis and it will sometimes require bacteriological methods to distinguish between the two.

TUBERCULOSIS OF THE THROAT.

We sometimes find the glands situated above and behind the posterior openings of the nose affected in such a manner that they increase enormously in size, large abscesses forming which block up the air passages to a certain extent causing the animal to breathe at first, perhaps, with a wheezing noise; afterwards it becomes loud and snoring. Cases of this kind have been brought under our notice when the animal was threatened with suffocation if she attempted to graze from the ground or depress the head unduly. When, however, such an animal would elevate her muzzle she would breathe with comparative ease. This I have accounted for by the fact that these tumors are loose in their connection with surrounding tissues, and are thus possessed of considerable freedom of motion; so much so that when the head is in a favorable attitude, as it is when held high, they drop back and thus permit the air to pass through fairly well, while when the head of such an animal is depressed the enormous tumors will naturally gravitate towards the ground and by so doing will drop, so to speak, into the posterior openings of the nasal chambers and block them to some extent. In aggravated cases of this description there will be more or less difficulty in swallowing and frequently a ropy saliva will drool from the mouth. It is not at all uncommon to find cases of this description accompanied with persistent paroxysmal cough, which indicates tuberculosis of the larynx (organ of voice).

GLANDS IN FRONT OF THE SHOULDER.

This system or group is situated in front of the middle of the shoulder blade and can be recognized by a swelling which will usually have a nodular feeling. I have met with cases where the enlargement in this region was comparatively enormous, one case that I can call to mind being as much as a foot long and say four inches in diameter, and oval in shape. This enormous tumor when cut down upon contained a large quantity, say a pint, of liquid, gelatinous pus. I may add to this, that on post mortem examination I found general tuberculosis of the animal, which creature was in the pink of condition and doing well, from the feeding standpoint, before it was killed. I merely mention this as another illustration of where tuberculosis can make extensive inroads upon the constitution of an animal without apparently causing it any inconvenience. But enlargement in this region can only be looked upon with suspicion.

GLANDS IN THE NEIGHBORHOOD OF THE STIFLE JOINT.

We sometimes find nodular excrescences situated in the neighborhood of this joint, occasionally reminding us of several peas or hazlenuts for instance, which can be moved about within certain limits in various directions. The surface which is affected with these little round lumps sometimes occupies considerable space around and about the joint, or, indeed, they may enlarge to the same extent as the case just mentioned, where the glands in front of the shoulder were at fault.

INGUINAL GLANDS.

In a general way the glands in this region are affected in about the same manner as those in front of the stifle.

THE POSTERIOR CERVICAL GLANDS.

Situated in the groove, occasionally called the jugular gutter, which is a channel that passes down the neck in close proximity to, but behind and above the wind-pipe. The symptoms when these glands are affected, are, in a general way, the same as when other glands upon the external surface of the body are the seat of the disease.

GLANDS ON THE INSIDE OF THE CHEST.

Situated between the lungs is a chain of lymphatic glands and vessels which, in the writer's experience, have been affected with tuberculosis in a greater percentage of cases than have the glands or tissues of any other single region of the body. These are called mediastinal glands.

In close proximity to these are the bronchial glands, which, however, to be more exact, are situated about the primary divisions of the windpipe into right and left branches. They are also often affected with tuberculosis. While these glands are within the chest, disease of them must not be associated with tuberculosis of the lungs themselves in as much as they do not enter into the composition of these organs. So far as the bronchial glands are concerned there is no method by which disease of them can be recognized that is known to the writer. With the mediastinal glands, however, I have met with cases which were associated with prominent symptoms which might raise our suspicions. One case occurred in an animal which was frequently affected with tympanites of the rumen, and had more or less chronic difficulty with the act of deglutition (swallowing). This animal was eventually killed and I had an opportunity of investigating the case and determining what was the cause of the peculiar ante-mortem symptoms. I was gratified to find sufficient evidence to account for the deviation from health in as much as I found tuberculosis associated with the mediastinal glands to an almost incredible extent, they being enlarged beyond all possibility of recognition, being increased in size by the formation of abscesses containing pus and caseous (cheesy) matter until they had assumed such enor-

mous proportions that they pressed upon the œsophagus (gullet) no doubt to a slight extent all the time, probably to a greater extent at certain periods, notably when the position of the body was such as to cause them to press with more force at one time than another. It is needless to say that this pressure upon the gullet would account for the symptoms of difficult deglutition, but it may not be known to the general reader that obstruction to the œsophagus will invariably cause distention of the first stomach with gas (tympanites). Those who have seen an animal choke on a potato or something else have no doubt noticed the bloating which invariably accompanies the accident.

TUBERCULOSIS OF THE WOMB AND OVARIES.

These and their surrounding membranes are often implicated in general tuberculosis. I have seen cases where the former was so distorted by the disease, thickening its walls to that extent that it could not be recognized by an ordinary observer, and would remind one upon feeling it of a hard rubber mass. On making a section of it the macroscopical (with the unaided eye) appearance of tuberculosis was very plain. With regard to the latter they are sometimes diseased so much that they will not perform their functions and animals affected with the disease in these organs are often permanently barren; although it is possible for them to be diseased in a modified form and yet the animal be fertile.

TUBERCULOSIS OF THE UDDER.

When the disease attacks this gland, or rather these glands, for there are four of them, the symptoms and lesions will vary considerably in individual cases so that anything like a description can only be given in the most general terms. A portion of one quarter may be affected or perhaps the entire gland. As it so often attacks a portion of the gland let me say that such cases will usually be accompanied with a circumscribed swelling which may be, we will say for convenience sake, the size of a hen's egg, being harder than the rest of the gland; but this hard lump need not be painful as might be expected. It will undergo various changes which are peculiar to tuberculosis; notably it will occasionally suppurate when pus may be discharged into the lactiferous ducts and will be drawn from the gland with the milk. In cases like this the poison of the disease is disseminated from an unsuspected animal most profusely. It is more or less unfortunate in connection with tumors of these glands that we cannot tell with certainty from ordinary clinical examination whether they are caused by the bacillus of tuberculosis or perhaps some less harmful organism, without resorting to bacteriological methods. To those who are familiar with the pathological changes which occur in the tissues affected with tuberculosis, macroscopical examination will enable them in many instances to differentiate with tolerable certainty between it and some other diseases. It is well known to veterinarians that the germ of contagious mammitis causes a certain amount of tumefaction of the udder which might easily be mistaken for tubeculosis by the casual observer or *vice versa*. In other instances all of the glands forming the udder may be affected with the disease in any or all of its stages.

TUBERCULOSIS OF THE BONES.

This is an interesting condition which occasionally occurs in young animals. It is said to have been produced experimentally . The bones most often affected are those entering into the formation of such joints as the knee, hock, elbow and stifle. The portion of the individual bone which is usually affected is the delicate frame-work situated in the interior and called the cancellated tissue, which becomes red and congested to be followed by a fatty, caseated appearance; the animal in the meantime becoming very lame and at times unable to rise. In extreme cases the bone has been known to crumble away and sharp speculæ of it protrude through the skin.

TUBERCULOSIS OF THE JOINTS.

In cases of this description the disease generally begins in the lining membrane of them, and may form fungus-like growths extending even into the bone. The joints will become more or less enlarged and the animal will be very lame. Cases like this are sometimes attributed to rheumatism by the layman.

TUBERCULOSIS OF OTHER ANIMALS.

While tuberculosis is found affecting various domestic animals, and many wild ones, yet, according to the writer's experience, it is oftenest met with in cattle, next hogs, then horses, after which come sheep and goats. Of the carnivorous animals dogs and cats are quite often affected. Not only does it attack ordinary domestic animals, but we have well authenticated cases in the various animals of the zoological gardens and menageries, as well as fowls and birds of many kinds.

TUBERCULOSIS OF THE HORSE.

I have rarely recognized the disease as affecting this class of animal, but a description of one well marked case which came under my observation in this State will answer as a typical case.

The horse was reported to me as affected with glanders. Upon visiting the animal I was not long in deciding that I had something else to deal with besides glanders, and asked the owner as to the previous history of the creature. He informed me that the horse, as might be supposed, often changed hands, but had been in his possession for a number of months. The former owner stated to him when he purchased the animal that it had only a cold but would soon recover. And the man's statement, within certain limits, was true, for it happened that the balmy days of early summer soon set in. The horse was kept out of doors most of the time and the return to health was remarkable. While it was true that the animal never got entirely well, yet it was so much improved that the person who owned it at the time of my examination thought it would eventually recover entirely. As soon as the weather became unfavorable, as it did in the fall, the horse began to lose ground again, and to make a long story short, was soon reduced to little more than skin and bones. It had a profuse discharge from the nostrils and the deep hollow cough, which so often accompanies this disease, was present in a marked manner and could be easily provoked at any time by requiring the animal to move sharply. The cough, as I observed it, was always accompanied with profuse expectoration. The absence of the various symptoms of glanders, together with the peculiar cough, history, emaciation, etc., caused me to diagnose the case as one of tuberculosis. I was enabled to verify my opinion the next day for it was decided to dispose of the animal in a somewhat summary manner, which gave me an opportunity of holding a post mortem upon it, after which I was fully convinced as to the correctness of my previous diagnosis.

This disease is stated by Prof. Bang to be of quite frequent occurrence in Denmark, and he accounts for its frequent appearance there by the fact that horses in that country are often fed upon skim milk. In writing upon the subject that author says: "Tuberculosis in horses is not rare in Denmark, doubtless because of the extensive use of milk in fattening young ones intended for market. This usually appears as feeding tuberculosis, with intestinal ulcers and very large deposits in the mesenteric glands, sometimes also in the peripharyngeal glands (glands of the throat) and with secondary deposits in the lungs."

Nocard, a French authority, on the other hand, writing of this disease, says that tuberculosis is comparatively rare in the horse. Nevertheless, during the past fifteen years, a sufficient number of instances of it have been published to enable one to attempt to describe the principal forms it assumes.

In the horse the disease may be localized either in the organs of the abdominal cavity or in those of the thoracic cavity. It begins sometimes in the former, sometimes in the latter, then becomes general, but most frequently it is by means of the digestive tract that the infection finds its entrance. Curiously enough all the cases hitherto observed have been isolated ones, in spite of the fact that the affected animal, as a rule, belonged to a large stable. The explanation of this appears to be, firstly, that the lesions usually develop first in the organs of the abdominal cavity, the lung being next attacked; but at a later stage. The horse being no longer fit for work it is soon killed. The tubercular horse rapidly becomes unfit for ordinary duties so that pulmonary lesions, when present, have not time to undergo the softening necessary to produce the nasal discharge or virulent expectoration which constitutes the most potent agents of infection.

Although it is certain that the intestinal tract is the principal entrance gate for the bacillus, nothing precisely is known as to the origin of the contagion. Lehnart has published an interesting case of a foal which became tuberculous as the result of a long stay in a stable with some phthisical (consumptive) cows.

LESIONS.

Nocard further says in substance: The lesions which are found at the autopsy of a tuberculous horse are usually very different from those we have studied in the cow and pig. Most frequently, as we have said, the disease begins in the organs of the abdominal cavity,—it attacks the glands, especially the spleen and the liver, the peritoneum and intestines being sometimes affected. The lung is, as a rule, attacked secondly. In opening the abdomen a variable quantity of yellowish, transparent or reddish liquid always flows out. The peritoneum (lining membrane of the abdominal cavity) is sometimes studded with firm, gray or whitish, rounded tumors, about the size of a millet seed, pea, or the hazelnut. The glands beneath the lungs are sometimes enormously enlarged, the tumor being irregular and knobby and presents on section a smooth, succulent, white surface, crossed by gray veins, which is sometimes uniformly tough and resistant, but more frequently softened and caseous in places. The glands of the border of the intestines are generally very large and white or grayish pink in color, sometimes homogeneous, succulent and firm, sometimes completely caseous. The spleen is generally enormous and enlarged in all its dimensions. It is stuffed with round, white, firm, succulent, caseous tumors of a size varying from that of the hazelnut to that of an apple. Its tissue is firm and when it is cut into the minute structures forming it are greatly enlarged, being as big as peas, and their pale pink color shows up well against the brown-red background of the organ. The liver is always very large and is sometimes infiltrated with tumors like those of the spleen. On section the surface is often seen to be crossed by delicate, grayish white veins which define the lobulations of the organ very distinctly. The intestines are fairly often the seat of important lesions which are especially found in the glands of that portion called the ilium, especially Peyer's patches. Sometimes the lesions consist of actual thick tumors which are flabby and red and have a fairly smooth surface. Sometimes the tumors are ulcerated and contain a yellowish or blackish, fetid pulpy material. Sometimes there only exists at the site of the patch an ulcer the depth of which is increased by the thickening of the mucous membrane at this periphery. The lung is always infiltrated by lesions which are obviously more recent than those of the abdominal organs. This is very large and heavy; notwithstanding it floats in water. When cut it gives the sensation of a tough, slightly indurated tissue. The cut surface has the following appearance: On the uniformly vivid red background appear a multitude of dirty white markings which are irregular and branching and anastomose, so as to give the organ an irregular lobulation; this abnormal new tissue is homogeneous and has the same general appearance throughout the whole of its depths; in no part of it are there nodules with tough, fibrous walls or cavities or foci of softening; and, in fact one would say that it consisted of irregularly distributed patches of infiltration, of the interlobular and coated tissue. All these lesions are extremely rich in specific bacilli, which always seems to be a little longer than in other animals. We have seen, however, that inoculation in the guinea pig and cultures show that they are identical with those met with in other mammalia.

Sometimes the disease begins in the lung and the lesions are then very variable. Sometimes they consist of rounded nodosites as big as a hemp seed, a pea or a hazelnut, distributed with a fair amount of regularity throughout the substance of the organ. These small tumors are composed of collections of soft, caseous material, very rich in bacilli, surrounded by thick, tough, fibrous walls. At other times the lesions resemble sarcomatous growths generalized throughout the lung. These growths are white, tough, homogeneous throughout, devoid of areas of softening, of a size varying from that of the hazelnut to that of a walnut or pigeon's egg, and do not appear to irritate the pulmonary tissue which preserves its normal appearance in their immediate neighborhood. They consist of collections of a greater number of tuberculous follicles, have no tendency to caseation, and very rich in giant cells and very poor in bacilli. Lastly, the disease sometimes consists of a more or less extensive caseous pneumonia with bronchial dilatations and cavities as the result of progressive softening of the caseous tissue. In all these cases the bronchial glands are attacked early. They are hypertrophied (enlarged) and either stuffed with miliary nodules or, as is more frequent, caseous and softened. Sometimes also the pleura and pericardium (covering of the heart) are attacked by more or less severe tuberculous lesions. These lesions consist either of miliary nodules which are isolated in clusters greyish or whitish, rather tough, and always small or else of a considerable thickening of serous membrane which seems to have undergone utter caseous infiltration. There may be also found variable lesions of the lymphatic glands, of the uterus of the mammæ, etc. In addition, ulcerations of the bronchi, of the trachea, of the larynx, and even of the nasal cavities have been discovered. It is important to note that tuberculous lesions of the horse very rarely become calcified.

SYMPTOMS.

"The predominating symptom in most of the cases that have been observed bas been inability to work at a time when nothing else in the general state of the animal seemed to indicate that it was ill. It is quickly out of breath, and on the least effort being required of it soon stops and with heaving flanks, head extended, and nostrils dilated, and limbs trembling, it refuses to go on. The most careful examination of the system fails to discover any lesion capable of explaining this loss of power. Soon rapid wasting supervenes in spite of a fair appetite and good food; at the same time profuse polyuria (profuse discharge of urine) comes on and persists for several weeks, playing an important part in the rapid wasting of the subject. Not only is the quantity of the fluid excreted increased to double, triple, or quadruple the normal, but changes in its composition also take place. The proportion of uria is greatly increased. Uric acid which is normally absent, is found in relatively large amounts, while hippuric, usually so abundant, is present in very small amounts or absent altogether. Briefly, the appearance of the tuberculous horse is that of an animal which is consuming its own flesh. Polyuria is recorded in all the cases described by Nocard.

All these signs become rapidly pronounced. The animal falls into a state of marasmus. It is only able to stagger along. Its appetite becomes capricious and fails altogether. The fever becomes constant, the temperature often being higher in the morning than in the evening, and hardly ever rising more than one or one and one-half degrees above normal. At this period the quantity of urine excreted may become normal, and it sometimes contains a small quantity of albumen. At this period, also, auscultation reveals some harshness of the vesicular murmur, which is, however, everywhere retained, and sometimes here and there a little crepitation at the end of respiration. The resonance on percussion is everywhere normal or very slightly diminished. The heart may show slight functional disorder; the first sound is duller and sometimes reduplicated, the second sound is sharp and more distinct. From time to time a slight pulsation in the veins shows the difficulty which the ventricle has in driving forth the blood which distends it. There is nothing very significant, in fact, about any of these symptoms. Towards the close of the disease congestion of the lungs and profuse diarrhœa may intervene. All these signs are especially noticed in abdominal tuberculosis, which is the most common form of the disease and has been most studied. Rectal examination often increases the probability of the diagnosis, by revealing the presence of the bulky tumor in the sub-lumbar region. In the pulmonary form of the disease a cough is nearly always present, which is nearly always short, dry and paroxysmal. The cough is usually accompanied by a small amount of mucuous discharge from the nostrils. This discharge is seldom abundant or purulent, since for that to occur the pulmonary lesions must undergo caseous softening and become transformed into actual cavities communicating with the bronchia. Excepting in very rare cases where this latter occurrence has taken place, the examination of the lung gives but little more information than it does at a late stage of abdominal tuberculosis. However, when the pleura is attacked a more or less copious effusion may take place which will reveal itself by the ordinary signs of hydrothorax. There have also been described repeated nasal hemorrhages and specific congestions of the external glands, such as the sub-glossary, parotidean, etc."

DIAGNOSIS.

"Diagnosis of tuberculosis of the horse does not seem very difficult. Five times I have been able to make the exact diagnosis of abdominal tuberculosis. The feebleness, the shortness of breath, the progressive wasting, the condition of the urine, and the finding of the bulky tumor in the sub-lumbar vault are characteristic. In the pulmonary form the cough does not constitute so imporant a sign as the sub-lumbar tumor in the abdominal form, but if there is any discharge from the nostrils the microscopic examination and inoculation of it will enable one to make a certain diagnosis of it readily enough. Lastly, injection of tuberculin is of greatest use in doubtful cases."

Tuberculosis affecting the hog has been described in another part of this report.

TUBERCULOSIS IN THE SHEEP AND GOAT.

These animals appear to be very refractory to the germ of this disease, having been reported as resisting sub-cutaneous inoculation; but it has been produced by injecting the poison into the veins. The repeated injection of tuberculous material rich in bacilli also succeeds in infecting them. It is more or less difficult to diagnose the disease in sheep, there being other complaints which produce similar symptoms; certain kinds of worms in the lungs will cause an aggravating cough, which to some extent resembles the cough of tuberculosis. In this State I have examined animals affected with a certain form of lung worm which even the post mortem examination might easily lead the casual observer to suspect tuberculosis. So in this animal it is risky to form an opinion without microscopic if not extended bacteriological investigation. Characteristic lesions of tuberculosis upon the pleura and in various parts of the abdominal cavity would justify one in forming an opinion in some instances should such lesions be present in a marked manner.

TUBERCULOSIS OF THE DOG AND CAT.

In those cases that have been brought under my notice, general emaciation, inability to stand fatigue, persistent cough accompanied with remittent periods of apparent convalescence have been the most marked feature of the disease.

TUBERCULOSIS IN BIRDS.

Few people in this country have given much attention to the disorder as affecting this class of animals, and consequently pet birds may literally be the hot-bed of a disease which will cause sickness and death to the owners of these animals, without the slightest suspicion ever having been cast upon the bird-cage or poultry yard. Koch has demonstrated the course of tuberculosis in fowls and observed the bacilli to be very abundant in the intestines and liver, while Nocard speaks of the peritoneum, lungs and joints as being affected, and Walley gives a beautiful illustration of the disease affecting the mouth and throat of a hen, in his work on meat inspection. Others speak of the horny tumors of the skin, face, head, neck and feet as being common accompaniments of the complaint, which often contain numerous bacilli within their meshes. A more or less interesting statement is made by Salmon with regard to the dissemination of tuberculosis from the bird to the human being in his most interesting paper upon Avian Tuberculosis read before the United States Veterinary Medical Association at their last meeting, in which he says: "An observation indicating still further the danger to mankind of contagion from certain birds was recently recorded by Durants. The subject, a woman seventy-one years old, without any previous history of disease, was seen among the patients of that well-known hospital, the Hotel Dieu. The woman had lost a daughter of tuberculosis in 1885 and was living with another daughter aged thirty-five years who was rachitic and probably tuberculous. In 1890 she was presented with a sparrow. In 1892 this bird which had previously been in good health appeared to be ill. It became dejected, irritable and one day pecked its mistress at the root of the thumb nail with sufficient force to cause slight bleeding. The illness of the bird continued and it finally died without the nature of the disease having been determined. Five or six months after receiving the slight wound the woman noticed a crust forming at the injured point. As this lesion continued to develop she came to the Hotel Dieu for treatment in April, 1894. She was found to be affected with lupus (tuberculosis of the skin) which had invaded two-thirds of the dorsal surface of the second phalanx of the thumb. There existed in addition a second nodule the size of a pea at the middle of the interior surface of the forearm and two similar ones in the fold of the elbow joint. The lupus was treated by the cautery and the woman appeared completely cured in December, 1894. The nodule in the fore-arm was extirpated and divided into two parts. One portion was examined histologically and showed the characteristic tuberculosis with numerous giant cells, but it was impossible to discern the bacilli. The other portion was used for the inoculation of a Guinea pig which died of general tuberculosis. From the spleen of the Guinea pig there were inoculated a pigeon which was sacrificed at the end of a month and found free from lesions, and a rabbit which died at the end of a month of generalized tuberculosis. The woman was therefore affected with tuberculosis. As no examination was made of the sparrow it could not be positively affirmed that it was affected with tuberculosis, but the fact that it was affected with a chronic and fatal disease and the development of the lupus at the point injured by the bird's beak are strong presumptive evidence that it was suffering from this disease, as the tuberculous lesions with birds are frequently localized at the commissure of the beak and as the saliva may contain numerous bacilli, it is easy to understand how the inoculation might occur. Whatever may be our views therefore as to the identity of the tuberculosis of mankind and of the gallinaceæ, it is demonstrated beyond question that certain caged birds may contract human tuberculosis and become centers for its dessemination. This is a most important fact for veterinarians and sanitarians in general and for the public to recognize."

With regard to the symptoms of tuberculosis in the bird they can only be spoken of in a somewhat general way, auscultation and percussion being of but little value in these creatures. The cough, too, is not of such a nature, so far as has been observed, to enable one to recognize it as the cough of a tuberculous patient. There are, however, some symptoms which assimilate tuberculosis in other animals, for instance, prostration accompanied with marked emaciation. When the joints are involved the animal will be lame. When the mouth is involved, as it often is, the lesions of disease can be seen by forcing this cavity open especially in birds of the size usually found in the poultry yard.

ETIOLOGY OR CAUSE OF TUBERCULOSIS IN THE POULTRY YARD.

Many cases of the disease are occasioned by the importation of animals affected with the disorder but a number of cases have been reported to me where I suspected, to say the least, that the disorder was the result of expectorations from phthisical attendants of these animals, which suggests that persons who are affected with the disorder should not take charge of the poultry yard, or if they do they should be exceedingly particular with regard to the distribution of all expectorations.

MACROSCOPIC, OR OCULAR APPEARANCE OF TUBERCULOSIS.

This materially depends upon the course which the disease pursues during its invasion of the affected part and can only be described in a somewhat general way, without making the description too lengthy for those who have to read and run.

In typical cases where we have the miliary variety—let me say in the first place that this term is supposed to have originated from the fact that little groups of numerous tumors about the size of the millet seed are found studded, to a greater or less extent, over the surface of certain membranes, such, for instance, as the pleura (the membrane lining the chest) or the same membrane which is also reflected immediately over the lungs. I have seen cases where the omentum, commonly named the caul, has been studded with scores and scores of these little nodules, varying in color from a pearly white to a pink or greyish hue. In other instances we find the disease consuming a considerable space, if not the entire organ involved. In such cases I have found it a more or less hard rubbery like substance, this when cut into produces a sensation upon the knife which reminds one of the grating occasioned by cutting through so much sand and clay mixed together. Indeed this gritty sensation which is imparted to the blade of the knife by the impacted mass of diseased tissue is nothing more or less than certain salts of lime which are to be found in large quantities in advanced stages of the disease. Then, again, we find these lumps, large or small as the case may be, filled with a material that has a cheesy consistence, hence the term, *caseous tubercle*. In other instances the tumor will be broken down in its center and the walls of it inclose a thick, creamy-like fluid which varies materially, according to circumstances. Appearances such as I have endeavored to describe are to be found in connection with the various organs of the body. In the early stages of the disease we sometimes find recent tubercle presenting a red color, resembling red hepitizadation while in other instances the surface of the affected gland will have a gelatinous granular appearance.

CHEMISTRY OF TUBERCULOSIS.

According to the investigations of some chemists, notably Dr. Glover of New Castle, as quoted by Williams, tubercle consists of animal matter mixed with certain earthy salts; the relative proportion of these varies in different specimens; the animal matter is more abundant in recent tubercle and earthy cells in chronic tubercle; the animal matter consists almost entirely of albumen mixed within a minute quantity of fibrin and fat; the earthy salts are principally composed of the insoluble phosphates and carbonates of lime with a small proportion of the soluble salts of soda.

GENERAL SUMMARY OF ORDINARY SYMPTOMS.

What has been said concerning the symptoms of tuberculosis can only be regarded as links in the chain of evidence condemning the animal as being affected with the disease. They are sufficient, however, to show the intelligent reader that the diagnosis of tuberculosis is not a trivial matter; and, if the brief description does nothing more, it is hoped it will save innocent persons from being victimized by those who assert their opinions firmly and positively, but who really know very little, if anything, about the disease.

SCIENTIFIC DIAGNOSIS OF TUBERCULOSIS.

If we desire to proceed in a truly scientific manner with our diagnosis of tuberculosis we may do so by employing one or all of the three following methods; namely, a microscopic search for the bacillus; inoculation of suspected material; or injection of tuberculin.

At one time it was hoped that the microscopist could diagnose the disease with his instrument. And so he can in many cases, but because he does not find the germ in any of the excreta it does not prove the animal free from the disease. The germ may be there one day and away the next, or the poison may be eliminated in such a condition as to escape detection by any known method so that his efforts are thus defeated. Again it is well known to microscopists, that it is sometimes a matter of much difficulty to find the germ in tissues which are even badly affected with the disease without the most extended and careful search. It is apparent, then that it is not a difficult matter to overlook its presence. Notwithstanding this we are frequently gratified by being able to diagnose the disorder with absolute certainty by means of the microscope.

If we are unable to find the germ with this instrument the method of inoculation may be resorted to. It is perhaps unfortunate that this method of diagnosis consumes much time; it often being several weeks before the disease has developed in the inoculated animal to the extent that it may be recognized. So the bacteriological mill is rather slow or uncertain for ordinary commercial purposes of today; especially when we have such a valuable, effectual and certain diagnostic agent as Koch's Lymph or Tuberculin. The description of this remarkable substance was first announced to the public about six years ago, at which time it was thought to be a curative agent for tuberculosis. It did not, however, give as flattering results as were looked for, so it was abandoned by many as a cure. However, future investigation may revive an interest in it, and show that it has curative properties if used under certain conditions yet to be determined. But even without this curative value tuberculin is now recognized the world over as the most reliable, safe and practical method of diagnosing tuberculosis in the early as well as the later stages, that is in the possession of mankind, and consequently becomes a boon to our race. It may be interesting to note that when this agent was first used it caused an elevation of temperature in the body above the normal, eight or ten hours after it was injected, while it was noticed that animals free from the disease were not affected with this elevation of temperature. This soon led veterinarians to apply it as a diagnostic agent. Without following its history very closely let me say that it has fought its way to the front, as it were, until today there are few, if any, who dispute its diagnostic value. But, like all new things, it had to run the gauntlet of adverse criticism, some saying that many cases were unaffected by it,—too many, indeed, to warrant its use in a general way, and so on. As time wore on, however, those who persisted in the use of it, became most enthusiastic in its praise, as its great benefit was slowly but surely impressed upon them, and the errors in diagnosis which were blamed to tuberculin are now being accounted for in some other way. Indeed, carelessness in searching for the lesions is now admitted to be the cause of many failures in discovering them. Some, however, asserted that an objection to its general use was that it caused reaction in other diseases, notably actinomycosis, or lumpy jaw; while others contended that it left some cases of advanced tuberculosis unaffected, missed them, so to speak, on account of the medicine not causing its characteristic reaction. With regard to the first objection I may say that, while the agent may not be infallible, yet I have tested it in three cases of actinomycosis, and it did not cause characteristic reaction. It may be interestng to note that in two of these cases I followed the disease through the bacteriological mill. The contents of the tumors were examined microscopically for the bacilli and none found. The same tumors were then examined for the ray fungus of actinomycosis and it was readily discovered in great profusion. Some of the material was then injected into the abdominal cavity of a Guinea pig with the usual bacteriological precautions but, up to the present writing tuberculosis has not manifested itself. In another instance I applied the tuberculin test to a number of cows. Two of them had external manifestations of actinomycosis; one of them reacted in a manner indicating tuberculosis,—the other did not. The inference was that one cow had tuberculosis and actinomycosis at the same time, while its stable companion which did not react, had only actinomycosis. It was my intention to have followed these cases, step by step, through various bacteriological methods, but, owing to the herd becoming involved in litigation, I was unable to proceed in the manner I had first intended.

With regard to the second objection, I have in mind several animals which presented striking evidence of tuberculosis, on ordinary examination, having more or less cough, capricious appetite, loss of flesh even to emaciation, and general conditions which would lead one to regard them as pronounced cases of tuberculosis. I applied the tuberculin test to all of these animals, more as a matter of curiosity to see how it would affect them, and will say that to my surprise, it did not produce its peculiar and characteristic reaction. I supposed that these were cases of failure, and was inclined to blame the tuberculin, until an autopsy was held; when I was amazed to find,—or rather not to find,—any evidence of tuberculosis upon macroscopical examination. Two of these cases were diagnosed as chronic or interlobular pneumonia and the third one as chronic indigestion. The fourth case was followed even further,—microscopical examination being made of the diseased tissues, but the germ could not be found. Inoculation of the diseased portion of the lesions was then made into a Guinea pig, but that animal has not shown any evidence of the disease, either upon ante or post-mortem examination notwithstanding that several months elapsed since the operation was performed. All evidence in this case is opposed to tuberculosis, except perhaps, the general appearance of the cow, before it was killed. I have used tuberculin in upwards of a thousand instances in this State during the past two years and have not discovered a case in all these which would impeach the test. Further accuracy of the test may be gathered, if necessary, from the following, which is recorded by the experiment station of Alabama:—

"Out of 4,068 animals in various parts of the United States, tested by various persons and various forms of tuberculin, 1,137 animals reacted and 1,118 exhibited undoubted tuberculous lesions upon post-mortem examination. In 19 of these that reacted the investigator failed to find any visible tubercular lesions. The microscope was not used and possibly the post mortem examinations were not as thorough and complete as they might have been." Admitting that the 19 cases were not tuberculosis, this would be less than one failure in 500 tests. In Massachusetts the cattle commission have tested over 25,000 cattle and they have found the tuberculin at fault in only one out of every four hundred cases tested."

The application of the tuberculin test has proved so accurate in diagnosing the disease in this country that the United States Veterinary Medical Association were led to adopt the following preamble and resolutions concerning it, at their last meeting, held in Buffalo, in September, 1896.

"WHEREAS, Tuberculosis of some of our domestic animals, and especially of cattle, is a wide-spread and destructive disease; and

"WHEREAS, The statistics accumulated during the year past show that the disease is very prevalent throughout this country, especially in dairy herds, indicating that it is steadily increasing, except in states where active measures for its suppression have been enforced; and

"WHEREAS, There exists in some quarters a difference of opinion as to the relation of tuberculosis among cattle to the public health, notwithstanding the fact that this matter has been the object of careful scientific inquiry by a great number of eminent scientists in all parts of the world, and that reliable and uniform observations are recorded in great numbers in the veterinary and medical literature by it;

"*Resolved*, That it is the opinion of the United States Veterinary Medical Association that the following points have been demonstrated beyond dispute, and may be accepted as fully established:

"First, that tuberculosis of man and cattle is identical. Second, that the milk from cows with tuberculous udders may cause tuberculosis in animals fed upon it. Third, that the milk from cows with extensive tuberculosis, but apparently healthy udders, may, in some cases, contain the germ of tuberculosis, and cause the disease in animals fed upon it. Fourth, that in some cases the germs of tuberculosis appear in the milk of tuberculous cows that are not far advanced in the disease, and of others that are healthy, so far as can be determined by an examination made during the life of the animal. Fifth, slightly tuberculous cows sometime succumb to the sudden exacerbation of tuberculosis and furnish virulent milk for a period before it is possible to discover their conditions by means of physical examination. Sixth, tuberculin furnishes incomparably the best means of recognizing tuberculosis in the living animal. Seventh, tuberculin, properly used for diagnostic purposes, is entirely harmless to healthy cattle and is so exceedingly accurate in its effects that the few errors resulting in its use cannot affect the general results, and are of less frequent occurrence than following the use of any other method of diagnosing internal diseases. Eighth, that the carcasses of tuberculous animals may be and sometimes are dangerous to the consumer, and all carcasses should be subject to a rigid inspection by a competent veterinarian, and those that are condemned should be disposed of in such a manner that it will be impossible to put them on the market for consumption as human food. Ninth, that the importance of dairy inspection cannot be overestimated, and municipal and health authorities should at once perfect a system commensurate with the vast importance of the subject.

"*Resolved*, That the live stock, and especially the breeding interests of this country, can never regain their former prosperity until such measures have been carried out by the National and State governments as will afford some reasonable guaranty against the continued ravages of this disease. And, in view of the prevalence of bovine tuberculosis in foreign countries and the measures taken by some of them to protect their cattle from infection, the United States should prohibit the importation of breeding animals until they have been proven by the tuberculin test to be free from the disease."

Having said so much in favor of tuberculin as a diagnostic agent it is only fair to discuss the other side of the question to some extent, as my own experience might lead one to become too favorably impressed with this agent. This side of the question is so ably discussed by Prof. Law in his bulletin No. 65, Cornell University Experiment Station, that perhaps I cannot do better than insert his paragraphs here, to wit:

"OBJECTION TO TUBERCULIN AS A TEST.

"First, the temperature sometimes rises in a non-tuberculous cow after the use of tuberculin.

"This is true. So does the temperature sometimes rise in a non-tuberculous cow when no tuberculin has been employed. Every animal is liable to suffer from inflammation and fever, and if such inflammation and fever set in after the use of the tuberculin test they are liable to be charged to it as their cause. This is a valid argument against the reckless popular use of the tuberculin, but surely not against its use in skilled hands. The person who uses the tuberculin on cattle must be a trained veterinarian, acquainted with the different diseases of cattle, and on his guard against confounding any of these with the temporary fever caused by the tuberculin in the consumptive. If it claimed that every rise of the body temperature after the use of tuberculin must necessarily demonstrate the existence of tuberculosis, then truly tuberculin will be discredited. But if it is held, rather, that a rise of temperature after tuberculin, in a cow that furnishes to the most careful and skillful comparative pathologist no evidence of other disease, implies the existence of tuberculosis the claim is substantially correct. To secure the valuable testimony of tuberculin, the practitioner must be highly skilled in the diseases of the animal operated on. If he is not he will be occasionally misled.

" Again *heat* or *bulling* may come upon a cow after the use of the tuberculin and the temperature may rise two or three degrees. To call such a cow tuberculous would be inexcusable carelessness. Yet the condition demanded, the rise of temperature after the use of tuberculin, is present.

" Again a cow that is closely approaching calving has the temperature raised. If tuberculin is used it is often raised higher than it would be otherwise. It is therefore improper to use this agent on a cow at this period.

N. B.—I have often used tuberculin. Just before and just after calving and up to this time it has done its work all right, notwithstanding we should be ready to make allowances.—(Grange).

" Active exertion, exposure in the hot sun, confinement in a close building, the privation of water at the customary time and other conditions will cause rise of temperature. But such a rise would not imply tuberculosis, even after tuberculin.

" Apart from these and other such causes of error in unskilled hands, the rise of temperature under this test should be taken not as a condemnation of tuberculin, but as a stimulus to search for small occult tubercles. A thorough search will rarely prove fruitless.

" Second, The temperature sometimes fails to rise under the tuberculin test, though the animals be in the last stages of tuberculosis.

N. B.—My own experience in cases which were supposed to be in the last stages of tuberculosis which did not react were really affected with some other disease as was shown by other lines of investigation than the tuberculin test and reported in another page of this article, but I wish to emphasize the thought that we must be conservative in condemning tuberculin if it does not appear to do its work in a correct manner.—(Grange).

" Third, Tuberculin causes reaction in even the slightest cases of tuberculosis, in which the victims would survive for years and might recover.

" This charge is also true, and it is because of its truth that tuberculin is invaluable and indispensable as a diagnostic agent, in all attempts to put an end to the disease. An eminent German professor (Eggeling), in objecting to the use of tuberculin as a general test records the following experience. In a herd of 37 reaction after tuberculin occurred in 31, while 6 gave no reaction. When killed the six proved sound and the 31 without exception tuberculous. But of the 31 only one had general tuberculosis and was condemned as unfit for food, and one was sold as second class meat. The 29 brought first-class prices as meat, and having been only slightly affected would probably have lived for years without infecting others. Now it is submitted that the German standard as thus given is not radical enough to secure safety for man and beast, or to give hope of an early extinction of tuberculosis. The meat of the animal with two or three tubercles in one organ is generally, but by no means always, free from the germ. When the disease does extend from such isolated tubercles, as often happens, the germ is carried not only in the lymph, but in the blood, and with tubercle in the body no one can tell when the bacillus has passed into the circulation and reached the different organs. Tubercles usually form slowly and the bacilli must have been in the blood for some time before they show as fresh tubercles in tissues and organs distant from the old ones. The meat of a tuberculous animal can never therefore be fully guaranteed as safe to eat. But again, while a cow with one or two tubercles only in lymphatic glands, may not be liable to transmit the disease to others, yet whenever an extension takes place, the germs being carried by the blood and therefore throughout the whole system, there must always be danger of their escape from the natural surfaces (lungs, udder, liver, bowels, etc.) to infect other animals. And let it be borne in mind, this diffusion through the blood takes place before its occurrence is revealed by the formation of tubercles in new situations. So long, therefore, as a single victim of even slight tuberculosis is left in a herd it can only be looked upon as an invitation to a renewed extension of the disease. It also may become at any moment a source of infection for man through the use of the meat or milk. It is only in degree that the contagion of tuberculosis differs, as to its sanitary aspect, from that of any one of the more contagious diseases, and in all alike so soon as we attach more importance to the preservation of an infected animal that will probably recover, than we do to the radical extinction of the disease, we undermine and destroy the effectiveness of our sanitary work. Practically all cases of foot and mouth disease recover; yet the frequently occurring epizootics of this disease each cost from $5 to $10 per head over the entire bovine population. Of the victims of rinderpest and lung plague that do not speedily die, practically all recover. Are the slighter cases therefore to be kept alive to perpetuate indefinitely those disastrous visitations that sweep away values of hundreds of millions? Is the remorseless scourge of tuberculosis to be perpetuated, not only in herds, but in our homes as well, to save for a few months or years some tuberculous cows? No country has ever dealt successfully with any of these animal plagues on the basis of preserving the mild cases of recovery. Always and everywhere it has been by the radical and thorough extinction of the disease germ wherever found, that success has been achieved. While this cannot be done for man, it must be done for our flocks and herds if we would ever cut off this prolific animal source of tuberculosis from the human race. Even as regards the herds themselves the stockowner who would consult his own future interests, would at any cost exclude from his barns and fields every possible source of future tuberculosis.

"4th. A fourth objection to the tuberculin test is its alleged liability to produce tuberculosis in healthy animals, or to aggravate it in the tuberculous ones.

"Now, tuberculin, properly prepared is absolutely sterilized, so that it can plant no living germ nor start the growth of any tubercle in a healthy animal. The further claim that it aggravates tuberculosis which is already in existence, is too true, and is the sound basis of its value as a test. As a means of testing the existence of tuberculosis in man it cannot be too strongly condemned, since no man has a right to seal the fate of his fellow for the sake of finding out if he has tuberculosis. The same condemnation must be passed on the use of tuberculin as an alleged curative agent, except in those few cases in which the tubercle is confined altogether to the surface of the body, whence it can easily be sloughed off.

The existence or possible existence of an internal or deep-seated tubercle in man should forbid the use of tuberculin for diagnosis or for curative purposes.

"The same remark would apply to animals if we adopt the German view that it is impolitic to destroy those that are only slightly affected. If tubercle exists, to however limited an extent, tuberculin tends to aggravate it, and the owner who wishes to preserve his mild cases cannot desire to have them made worse, which means to have the disease extended and possibly generalized.

"So in government sanitary work. Unless the government is prepared to slaughter and pay for every animal affected with tuberculosis in however slight a degree, it has no right to use a tuberculin test. It is only when the State means to make thorough work in eradicating tuberculosis from the herds that the tuberculin test is at all admissible. But when the State aims at the thorough extinction of the disease in our herds this test cannot be omitted, as it is absolutely essential to success. The temporary aggravation of the disease is no possible harm, when the animal is to be promptly killed and paid for.

"To sum up: The tuberculin test aggravates existing tuberculosis and is, therefore, unwarrantable for use on man or on cattle that are to be kept alive; it is, however, the only known means of detecting many occult cases of tuberculosis and is, therefore, indespensable in any systematic effort to stamp out the disease by the purchase and slaughter of every tuberculous animal."

Having said this much about tuberculin it may be interesting to the reader to know just what this material is. It is, in substance the product of the germ of the disease, and is obtained something after the following fashion:

The germ of the disease is grown in a certain fluid manufactured in the laboratory by obtaining broth from veal to which glycerine may be added. This culture medium, as it is called is placed in delicate flasks and the seed, so to speak, from the pure culture of the tubercle bacillus is planted. After a time a growth appears over the surface of this fluid and in the course of several weeks the growth of the germ ceases. The fluid is then evaporated according to laboratory methods and the result is crude tuberculin. After manipulating the material on orthodox principles it is subjected to a degree of heat sufficient to remove all trace of life so that it becomes absolutely innoxuous so far as producing tuberculosis is concerned. The concentrated material is injected in the most minute doses, from four to six drops being sufficient to produce the characteristic elevation of temperature in the body of a cow weighing between one and two thousand pounds. For convenience in handling it is customary to dilute the concentrated solution before injection.

THE APPLICATION OF THE TEST.

The plan which I have adopted for applying the test is, substantially that which has been recommended by the bureau of animal industry of the Department of Agriculture at Washington, D. C., which suggests that the temperature of the animal to which the test is to be applied shall be taken every two hours during the day previous to the injection of the fluid. About ten o'clock at night the fluid is introduced beneath the skin of the animal—about a half teaspoonful of the fluid which has previously been diluted for convenience in handling. It is customary to administer about half the dose to yearlings and two-year-olds, while very large cows and male animals receive about a teaspoonful. It has been my custom to leave the animals to themselves after injection for about eight hours, when the temperature is again taken, and observations of the heat of the animal's body should be made every hour during the day after the tuberculin has been administered. My observation has been that those animals which are affected with the disease begin to react about nine or ten hours after the medicine has been given and continue to do so for about four or five hours when the temperature will begin to fall and soon reach the normal. There is, however, considerable variation in individuals in their behavior as to the time and degree of reaction towards the medicine. It is custimary to regard an animal as affected with the disease when it shows a temperature two degrees above the highest point of the day previous to the administration of the medicine. In cases where the reaction is less than two degrees it has been my practice, where I have had full control of the herd, to place such animal in the doubtful list, to be retested at a future time.

A brief account of some animals which were placed in the doubtful list will, no doubt, impress the reader with the very great importance of careful manipulation of the thermometer in reading it, and also impress upon him the advisability of retesting animals which have shown the slightest indication towards a rise in temperature the day after the fluid has been given.

On the 31st of March, 1896, I tested a herd of 67 cattle. Among them, nine animals reacted in a manner indicating tuberculosis, while 18 of them dropped into the doubtful list, one of which only reacted one-tenth of a degree, another three-tenths of a degree, another six-tenths of a degree, and still another one degree and eight-tenths. On the 11th of May these animals were retested. The first one reacted two degrees and six-tenths, the second one, six-tenths of a degree, the third one, one degree and five-tenths, the fourth, two degrees. The first and fourth were condemned according to the requirements of the test. The fourth animal was badly affected with the disease which was very apparent upon the most casual observation. The first one, or No. 1, although reacting two degrees and six-tenths did not show any external manifestations of the disease but was killed and after a diligent search some of the cheesy tubercle was discovered. Not being satisfied with the ocular examination the microscope was used when the bacillus was discovered. Besides this some of the material was inserted beneath the skin of a Guinea pig, which eventually died of tuberculosis and in this animal the germs could readily be seen when stained according to Zeil's method. No. 4 was also killed and showed such exaggerated lesions of tubeculosis that nothing more was done so far as studying the disease in her was concerned. Nos. 2 and 3 were again retested in August, No. 2 reacting two degrees and eight-tenths, No. 3 reacting one decree and eight-tenths. The latter two are at the present time being held for experimental purposes. It is worthy of note that three of the four animals would not have been considered as being affected with the disease according to the methods adopted in transatlantic countries where it is stated, according to a description of the application of the test, in a volume written by Nocard: "Elevation of temperature of less than eight-tenths of a degree has no meaning. Every animal whose temperature indicates an elevation between eight-tenths of a degree and one degree and four-tenths must be considered under suspicion and will have to undergo, after an interval of a month or so, a new injection of a larger dose of tuberculin." It is probably owing to the fact that sufficient importance has not been attached to the minutest elevation in temperature that tuberculin has been wrongfully blamed for missing cases that were afterwards shown to be affected with the disease. Setting the condemning figure at one and four-tenth or two degrees is only arbitrary as far as I am aware. Experience with tuberculin has caused me to believe that if this agent causes the elevation of temperature, even to a slight extent, it is an indication of tuberculosis. Unfortunately we are not able to tell whether it is the tuberculin or something else which causes this elevation, so a wide margin is taken and set at two degrees and mistakes are reduced to the minimum in careful hands.

It may not be necessary at this time to produce a detailed account of all the temperatures of cattle which have been tested in this State with the records of their post-mortem lesions, as such an account would burden the pages of this report without compensating the reader sufficiently for perusing them. It may, however, be interesting to speak in a somewhat summary manner of one case where I applied the test, it being of much interest in this commonwealth. The case which I have reference to was at the State Public School at Coldwater, to-wit: A year ago last May I was requested by the Board of Control of that institution to examine their cattle, as it had been reported that one which had recently been slaughtered was affected with some mysterious disease. I proceeded as requested and have here to say that I cannot call to mind ever having seen 26 animals in apparently healthier condition,—housed amid most comfortable surroundings with everything that an ordinary cow required. After having passed through the herd and watched their behavior in the stanchions for some time I stated to the superintendent of the institution that so far as I was able to see his herd appeared to be in a healthy condition. But I was well aware from an experience of many years that no man could detect the disease although it had made extensive inroads upon the economy of the animal. So I informed him that a number of them might be affected with tuberculosis. I suggested this disease because I thought from his description of the animal which had been slaughtered that this disease prevailed in its internal economy. It may be interesting to know that the cow referred to was not slaughtered because she was sick, but because she was ripe, or thoroughly fit for the shambles, and was not profitable in the dairy. After giving the authorities my experience with this disease it was finally determined that the tuberculin test should be applied, which was done in due course, and 18 animals out of 26 showed characteristic reaction, indicating tuberculosis. They were all slaughtered and in every individual abundant evidence of the disease was shown to convince the most sceptical without going beyond the macroscopical examination. The post-mortems were held in the presence of a number of physicians of the city of Coldwater, and also Professors Vaughan and Novy of the bacteriological laboratory of the University of Michigan, who, I may add, followed some of the tissues through microscopic examination and illustrated the presence of the germ in them.

PERCENTAGE OF CATTLE AFFECTED WITH THE DISEASE IN MICHIGAN.

Up to January 1, 1897, I have tested 849 head of cattle and found reactions indicating tuberculosis in 107 of them. This would be about 13 per cent of the number tested. It must be remembered, however, that my investigations have, with one or two exceptions, been amongst cattle in which there were good grounds for suspecting the presence of the disease. So that such a high percentage of affected animals can hardly be regarded as a fair estimate. In a few instances as a private practitioner I have tested a number of herds belonging to sanitariums of this State and have not found indications of the disease in a single instance. In one case I tested no less than 8 herds surrounding a city of about 12,000 inhabitants. The herds varying from 6 to 30 animals, and numbering in all 114. In another instance I tested 22 head in close proximity to a small city without finding indications of the disorder. These nine tests lean toward the idea that tuberculosis is the exception rather than the rule in the commercial cattle of this State—nevertheless too much emphasis cannot be laid upon the vigilant attitude we should assume towards the disease as it frequently manifests itself in the most unsuspected places.

THE GERM

is about one fifteen-thousandth part of an inch in length, its width being one-tenth of its length, more or less. It varies, however, somewhat in length in individual specimens. In stained preparations unstained portions are frequently seen which are believed by some to be spores, but this is by no means certain. From two to six of these unstained spaces may often be seen in a single rod, and owing to these alterations of stained and unstained portions the bacilli may under a low power be mistaken for chains of micrococci. The rods are usually solitary but may be united in pairs or in short chains containing three or four. In old cultures, irregular forms may be observed, the rods being sometimes swollen at one extremity or presenting the appearance of having a latter bud-like projection. These are called involution forms.

LIFE HISTORY.

The germ is a parasite which requires oxygen for its prolific growth, it will grow, however, in the absence of free oxygen. It is very exacting in its temperature requirements, only growing luxuriantly at all events within a few degrees of 102 Fahr. The question of spore formation has not been definitely determined but it is thought that the unstained spaces already alluded to may be spores and this idea seems to be supported by the fact that caseous material in which the most careful microscopical examination fails to find the germ of tuberculosis, but when a small portion of this caseous matter is inoculated beneath the skin of the Guinea pig it will produce the disease. The only feasible explanation which can be offered at the present time is that this material contained the spores of the germ, if not the germ itself. But at the same time the fact must not be lost sight of that these germs are exceedingly small and may have escaped detection in the material examined. There has been considerable objection offered by the most prominent workers to the idea that spores do appear in the bacillus. Without attempting to discuss this question further it may be better to leave that side of it to the bacteriologist.

VITALITY.

The germ is difficult to stain; due, it is thought, to toughness or some peculiarity of the cell wall, and there seems to be some relation between this condition and the vitality of the microbe, for it does not appear to be readily destroyed by ordinary means or long keeping. Koch, as well as others, have shown that it retains its vitality for nine months in dry sputum, after which period it is capable of reproducing the disease in an animal exposed to its influence.

In as much as the application of heat is a popular way of destroying this germ it may be interesting to quote a few experiments which have been performed to test the vitality of the organism under the influence of increased temperature. Considerable experimentation has been done by various noted men, and it may be only necessary for me to report here the results of their investigations. Assuming that the tubercle bacillus forms spores a number of experiments to determine the thermal death point have been made. The sputum containing the bacillus has been subjected to a temperature of 212 Fahr., and afterwards inoculated into Guinea pigs. It was shown that exposure to this temperature for from two to five minutes was effective in every experiment with but one exception. One Guinea pig died tuberculous after having been inoculated with sputum exposed to this temperature for two minutes. This result was assumed to show that the bacillus would survive lower temperatures but it is evident that additional experiments were required to establish this fact.

In 1887, Sternberg, Surgeon General of the U. S. Army, made a few similar experiments at lower temperatures, and Guinea pigs inoculated with tuberculosis sputum exposed for ten minutes to the temperature of 90 C., 80 C., and 60 C., *failed to become tuberculous*, while another Guinea pig inoculated with the same material after an exposure to a temperature of 50 C. for ten minutes died tuberculous.

These results correspond to those subsequently reported by Yersin, who tested the thermal death point of this bacillus by the culture method. This author assumes that the bacilli form spores, but states that as a result of his experiment that at the end of ten days, bacilli heated for ten minutes at 55 C. gave a culture in glycerine-bouillon, those heated at 60 at the end of 22 days while those heated to 70 and above failed to grow in every instance. This experiment repeated a great number of times always gave the same result. The bacilli, then, resist a temperature of 60 C. for ten months and it is to be remarked that the resistence of spores to heat appears to be no greater than that of the bacilli themselves. Yersin remarks in a foot-note that the spores which served for these experiments did not appear as more or less irregular granules taking the coloring matter strongly, but as vertible spores with sharply defined outlines to the number of one or two in a bacillus or three at the outside. These spores are particularly clear in cultures upon glycerine agar several weeks old.

Pursuing the investigation from a different standpoint, cold has been applied, but it has been shown that the germ survives a freezing temperature. The germs have been subjected to an influence of freezing for four or five days and still possessed their infecting properties. So that ordinary winter temperature cannot be regarded as an effectual disinfectant in a short time at all events.

Putrefaction within certain limits is not fatal to the germ, it having been shown that it will resist the influence of this condition for a considerable length of time,—over 100 days. It is not destroyed by the gastric juice of the stomach as shown by several investigators. A portion of the lung of the cow was preserved for 110 days, dried and pulverized, the dust of which produced the disease in Guinea pigs. It is preserved in water, in springs, in ponds and wells at ordinary temperatures for an indefinite time, hence the danger of permitting animals to drink from troughs that have been contaminated with the discharges from affected animals.

The germ is devitalized by exposure to the sun's rays for a time and even by diffuse light. It remains infective in the earth for a period not to be determined, possibly indefinitely. The salting of meat is thought to destroy it in about a month if the salt is liberally applied. The cooking of meat, if thoroughly done, will destroy the germ but it will require an absolute heat of say 160 Fahr. for 15 minutes, but it is difficult to determine the exact heat of the interior of a large roast, hence the necessary precaution of having meat thoroughly cooked to insure safety against this organism. Touissant found that broiled steak which had only reached 176 Fahr. was capable of producing the disease providing this degree of temperature was not kept up for a considerable length of time.

TREATMENT.

It is questionable from the moral standpoint, in the present light of our knowledge with regard to the cure of this disease, if treatment in a general way should be recommended, so we must be somewhat conservative in this matter.

While it is not admitted on all sides that the disease is incurable in every instance, yet the danger of unhappy results accruing from careless handling of affected animals warns us against prolonging the existence of such animals, although cases have been brought under the writer's notice which have been most convincing that the germ of the disease has been overthrown or conquered by the right kind of a constitution and proper hygiene. Concerning this phase of the question, we hope to have more to say in a future report.

PREVENTION OF THE SPREAD OF THE DISEASE IN A HERD.

We would recommend the application of the tuberculin test in all cases which are attended with the slghtest degree of suspicion and believe that it is a wise precaution to apply the test even in herds that are not suspicious, as much for the satisfaction of the owner as, perhaps, for anything else.

In herds which are sprinkled with the disease they should be divided into three clasess: First, those which fail to show any reaction to the agent, may be regarded as healthy; second, those which react less than two degrees are to be placed in the quarters provided for the suspicious list: third, those which react above two degrees should be placed in the condemned stalls if not summarily disposed of there and then. If the desire is to raise a healthy herd from condemned animals they should be kept by themselves and it would be well to have different attendants to wait upon the different lots. Pails and other utensils should be provided for the different lots of animals. If the condemned animals are to run at pasture a lane of from 15 to 20 feet wide should separate them from all others; a simple fence is not sufficient, though in the stables a close board partition may be all that is necessary.

OTHER PRECAUTIONS.

It is well to observe certain precautions in order to keep the disease out of a herd, and it is wise not to allow foreign animals, that is, cattle from other herds to mingle with our own unless they have been tested with tuberculin within a year or so. No cow should be permitted upon our premises with a husky, rattling cough, wheezing, hurried breathing, discharge from the nose, fœtid breath, hard tumors on any part of the body, swollen joints or general unthriftiness, or one which is suffering from chronic indigestion. These symptoms, one and all, are often the result of tuberculosis.

In testing animals it will be profitable to employ a skillful veterinarian, rather than to proceed with the aid of those who are not versed in the diseases of cattle. It is dangerous and improper to permit consumptive persons to attend to cattle.

Tuberculous animals that are to be destroyed are most effectually disposed of, germ and all, by cremation.

CARE OF THE STABLE AFTER DISEASED ANIMALS HAVE BEEN REMOVED.

The precautions will of course depend somewhat upon the value of the stall. If worn out and cheap it will be best to tear it down and place in a pile to be burned up at the earliest possible moment. In tearing down such stalls and removing the debris it may be well to saturate all parts with water in order that the germ, if present, may be prevented from floating in the air with the dust that is aroused by such a procedure. Some care should be exercised in handling boards of this nature, not to get splinters of them into the hands or other parts of the body. It may be well to wear leather gloves. The refuse matter and floors are also to be burned. If the stalls, on the other hand, are new and expensive, it may be well to wash them first of all with hot water, the hotter the better, after which they should be sprinkled with a mixture of corrosive sublimate, say one ounce to about 8 gallons of water. The water should be placed in wooden vessels and the sublimate added to it. The whole should be allowed to stand for 24 hours, to allow the sublimate to become entirely dissolved. Since this solution is poisonous it should be kept in covered vessels. It may be applied with an ordinary watering can or spraying pump, though it must not be forgotten that if allowed to remain in a metal pump it may injure that article to a considerable extent. Before the solution is applied all compost should be removed from the floor as well as other parts of the stall. This compost should be destroyed by burning, and in removing it the same care should be observed that was recommended with regard to the old stalls; that is, it should be thoroughly sprinkled in order to prevent the dust of it with attached germs from contaminating the air.

After the corrosive sublimate has been applied, say 24 hours, it is advisable to whitewash the stalls, mangers, stanchions and parts that are likely to come in contact with animals in the future. There are numerous solutions recommended for disinfecting stalls, but the one suggested is probably as good as any. The extra precaution of whitewashing is desirable for this material, when dry, forms a crust which will imprison any germs which might have escaped the spray of the disinfectng fluid and by prolonged drying they become harmless. A second coat of whitewash will not only be an extra precaution but it will add materially to the appearance of the compartment.

In preparing whitewash, the writer's experience has been that freshly slaked lime and water is preferable to any other mixture. We mention this because it is a common practice to put glue, salt and other minerals into the wash to cause it to stick, but instead of doing so it will often have the opposite effect, and cause it to scale and drop off. The stable, after being treated as above, should be thoroughly aired and all the sunlight let into it that is possible under ordinary circumstances. The cattle which may be left after the test should be housed as little as possible. Fresh air and sunshine being enemies to the invading germ by invigorating the constitution of the host, should be permitted to work their beneficial effects upon the animals on every possible occasion.

If the desire is to raise a healthy herd from condemned animals, and experiment gives color to the feasibility of such a plan, the calves should be removed from their mothers as soon as possible after they are born, placed by themselves, and tested with tuberculin within a month or so.

PRODUCTS OF THE COW.

The milk of animals having been shown to be such an important factor in certain diseases of the human family it has naturally become a serious matter for consideration, especially as to the best methods for handling this product. Having been more or less interested in this question for many years I have inquired in certain quarters concerning the regulations which are adopted by the common councils of some cities. I have made myself acquainted with some of the provisions adopted by some of these bodies, and from them I have compiled the following suggestions with the hope of aiding those who may contemplate similar measures. While gathering this information I have taken pains to inquire how it affected the pecuniary interests of the vendors of the milk, for it is pleasant, if nothing more, in requiring people to observe certain regulations, to frame them so that they may be a pecuniary benefit, rather than otherwise, to those who are most interested. The information I have obtained is somewhat conflicting, some being of the opinion that such regulations are a hardship, while others contend that they are a benefit to the trade. No doubt those who have a desire to elevate the status of their business can see the benefit of a license requiring a standard of excellence in the general management of all affairs connected with the business, while those who are not ambitious as to the elevation of the status of their calling can see nothing but hardship in being required to conform to certain rules and regulations. Were a milk-man to establish a business in any ordinary locality where a license was not required, and he were to adopt some or all of the provisions of the following suggestions, can it be doubted but that he would immediately attract the public attention of his locality and readily get a higher price for his milk, sufficient to go beyond the extra cost of living up to the conditions which he advertised.

The ordinances, as I have compiled them from various sources read something after the following fashion:

Whereas, It is expedient to regulate the milk industry of a certain locality by inspection of the dairies, cattle and cow houses, as well as various utensils used for various purposes in said industry, the following suggestions are made:

First. All cows giving milk for sale shall be clean and free from filth, especially in regard to their udders.

Second. The stable or stables in which any such cow is kept or housed, or in which it is milked shall be kept clean, well lighted and well ventilated.

Third. Such stables shall be lighted by a window or windows of not less than eighteen inches square, or two and one-fourth square feet for each four cows, or any number of cows less than four, if less than that number be kept.

Fourth. There shall be in each stable not less than 200 cubic feet of air space for each cow, and the ceiling, roof or floor above the stable shall be at least seven feet in height, that is, above the stable floor.

Fifth. Each such stable shall have a ventilator constructed through the roof of a sectional area throughout of at least one square foot for each ten cows kept in the stable, with a similar proportion of sectional area in such ventilator for a greater or lesser number of cows.

Sixth. The stable floor shall be at least eight inches above the ground.

Seventh. Such stables shall be whitewashed with lime every six months and shall be whitewashed within two months prior to the opening of such business.

Eighth. Drainage must be provided for every such stable so that no accumulation of water or liquid can take place within ten feet of the stable.

Ninth. Each dairy shall be provided with an adequate supply of pure water.

Tenth. The milk house or building in which milk is kept shall be entirely separated from and at least twenty feet distant from any stable manure heap or other objectionable object, and such milk house shall at all times be kept clean.

Eleventh. Care of utensils. All pails, milk pans, cans and other utensils used for containing or handling such milk shall be thoroughly washed with boiling water and fully cleaned immediately after the same have been used, and no such utensil shall be used, kept or placed in any sleeping compartment or living room of said house. All cans and utensils used in delivering milk to customers shall within one hour after the return of the same to the dairy or milk house or premises of such vendor be so washed and cleaned as aforesaid.

Twelfth. All milk shall immediately after milking be removed to the milk house, there properly strained and placed in open vessels, the temperature to be kept not higher than say 50 degrees, Fahrenheit.

Thirteenth. Vehicles used in the delivery or carriage of milk shall be kept clean and shall not be used at any time for transporting any swill, garbage, or other offensive material. In no case shall any can or other utensil used for containing or handling such milk be washed in water in any trough or other receptacle from which any animals are allowed to drink.

Fourteenth. Stables shall be kept clean. All compost must be removed at least twice daily, once in the forenoon, not later than ten o'clock, and in the afternoon after four o'clock.

Fifteenth. All cows supplying milk to such dairies shall be tested with tuberculin by a competent veterinarian.

In addition to the above, the following ordinance has just reached my headquarters. It is the milk ordinance of the city of San Jose, California.

AN ORDINANCE TO REGULATE THE SALE OF MILK.

Be it ordained by the mayor and common council of the city of San Jose, as follows:

Every person selling milk must have license.

Section 1. It shall be unlawful for any person to sell or offer for sale or have in his possession for the purpose of sale within the city of San Jose any milk, without holding at the time a license in full force issued by the board of health, authorizing such sale.

Conditions on which license shall issue.

Sec. 2. The board of health shall issue free of charge all licenses to sell milk but such licenses shall not be issued except upon the following expressed conditions to wit: That the person to whom the license is issued shall not himself or through the agency of any servant or employé sell or offer for sale or have in his possession for the purpose of sale milk from any diseased cow or any cow fed in whole or in part on still slops or any other food calculated to render the milk of such cow unwholesome or unsuitable for human food; or milk to which water or any foreign substance has been added or which contains more than eighty-seven (87) per cent of watery fluid or less than thirteen (13) per cent of solids, one-fourth of which is butter fat; or milk from which any portion of the cream has been removed unless such milk is represented at the time of delivery as "skimmed milk" and the words "skimmed milk" are distinctly marked in uncondensed Gothic letters of not less than one inch in length upon the outside and near the top of each can, measure or other vessel used in the sale and delivery of such skimmed milk.

Register of the dairy and the person to whom license issued.

Sec. 3. A register shall be kept in the office of the board of health in which shall be recorded the name of the person to whom the license is issued, the name of the dairy or number designation under which the business is to be conducted, if any such there be, of location of the dairy or other place from which the milk is to be supplied and the number contained in the license issued. If a co-partnership desires a license it shall file with the Board of Health at the time of application an affidavit of a member of the co-partnership, stating the names of the persons constituting the firm. And if a corporation desires a license it shall file a certificate by the president and secretary thereof, giving the names of the corporate directors.

Milk wagons to have number.

Sec. 4. All licenses shall contain the conditions mentioned in Section 2 of this ordinance and an agreement on the part of the licensee to faithfully keep and observe the same. Such licenses shall be made in duplicate, one copy of which shall be retained in the office of the board of health. The number contained in the license shall be plainly marked in a conspicuous place on the outside of the wagon conveying the milk, in figures of not less than three inches in height.

Samples of milk for inspection to be furnished.

Sec. 5. Any person having milk in his possession sold or intended to be sold, or in process of delivery for the use of any resident of the city of San Jose shall, on demand, deliver to the health officer or any member of the board of health free of charge for the purpose of inspection a quantity of such milk not exceeding a half pint taken from each can or other vessel in which the milk is contained, if so required. The health officer shall make a careful and thorough examination of samples taken, and if, upon such examination the milk shall not be found of the standard quality of purity and wholesomeness required by Section 2 of this ordinance, he shall file with the board of health a report in writing the specific particulars in which it is deficient and the board of health shall thereupon revoke the license of the person so found violating the conditions upon which said license was issued. Immediately upon filing said report the health officer shall make a complaint before the justice of the peace in and for the city of San Jose against the person or persons so found violating the provisions of this ordinance and no license shall be issued to such person or persons whose license has been revoked and against whom complaint has been made before the city justice, as aforesaid, until final acquittal or conviction upon said complaint and the payment of a fine or the serving of a term of imprisonment has been completed.

Veterinarian and health officer to inspect dairies.

Sec. 6. It shall be the duty of the health officer and the board of health to visit from time to time and inspect all dairies and other places from which milk is supplied and compel the keeping of such premises and all vessels and vehicles used in the business in a perfectly clean and sanitary condition, and any license may be revoked by the board of health for a failure to comply with its directions in relation to the matters.

N. B.—Another ordinance makes the veterinary inspector a health officer. (Grange.)

Persons violating this ordinance to be prosecuted.

Sec. 7. It shall be the duty of the health officer, the chief of police, and all police officers to detect and prosecute the persons violating any of the provisions of this ordinance.

Penalty.

Sec. 8. Any person who shall violate any provision of this ordinance shall upon conviction be punished by a fine of not exceeding $100 or by imprisonment in the city prison not exceeding thirty days.

Sec. 9. This ordinance shall take effect April first, 1895.

The following communication speaks for itself and is substantially the same as others from different quarters upon the same subject:

San Jose, Cal., 31st March.

E. A. A. Grange, State Veterinarian, Lansing, Michigan:

Dear Sir—Your communication of inquiry * * * has been sent to me * * * with the request that * * * I will send you a copy of our city ordinance and also one of our county ordinances appointing a county veterinarian and defining his duties, and in explanation will say that the inspector for the city and county is paid for by both governments, i. e., it is a dual office and until recently the inspector has been a member of the board of health * * * Our milk dealers take very kindly to the order of things; about three times a week we take up milk samples, and require them to show by the Babcock test a percentage of at least 3 per cent in butter fat, failing we revoke their license and prosecute them for selling diluted products; we have only had to make four arrests in a year and we have a hundred and fifteen milk licenses issued. A license costs nothing but every applicant must have a clean bill of health for his herd showing that every individual in his herd has been subjected to the tuberculin test, and without such license they are not permitted to sell any of the products of their stock. Milk has not improved in the price but the dealers feel that they are no longer objects of suspicion and that the merit of their products is justly measured and that the public bulletins of the result of the tests made a basis from which the public can estimate their worth * * *

(Signed) H. A. SPENCER, V. S.

PREPARATION OF MILK FOR INFANTS AND INVALIDS.

In the New York Medical Journal, February 4, 1893, Dr. Koplik describes the method used by him for several years in the Good Samaritan Dispensary in New York for the preparation of infants' food. The milk supply is derived from a reliable leading dairy and delivered in refrigerator tubs. The simple pasteurization of milk is useful, provided the milk is immediately cooled and used within twenty-four hours. If not afterwards cooled the pasteurization seems to increase the liability to fermentation. In thorough sterilization the danger to be avoided is the coagulation of the albuminoids or burning of the milk. Some authorities claim that the sterilization makes the milk too indigestible, while others claim that the digestibility is not affected, provided the sterilization is properly conducted and the milk is thoroughly stirred during the process. The latter process requires more care than the former.

Pasteurization can be easily carried on by any housewife.

The simplest plan is to take a tin pail and invert a perforated tin pie plate in the bottom, or have made for it a removable false bottom perforated with holes and having legs half an inch high, to allow circulation of the water. The milk bottle is set on this false bottom, and sufficient water is put into the pail to reach the level of the surface of the milk in the bottle. A hole may be punched in the cover of the pail, a cork inserted, and a thermometer put through the cork, so that the bulb dips into the water. The temperature can thus be watched without removing the cover. If preferred, an ordinary dairy thermometer may be used, and the temperature tested from time to time by removing the lid. This is very easily arranged, and is just as satisfactory as the patented apparatus sold for the same purpose.

In addition to the above:

Professor H. L. Russell, of Madison, Wisconsin, gives in bulletin 44 of the Wisconsin Experiment Station, page 17, the following directions for pasteurizing milk either for general or infant use:

1. Use only fresh milk (not more than 12 hours old) for this purpose.
2. Place milk in clean bottles or fruit cans, filling to a uniform level. (If pints and quart cans are used at the same time an inverted dish or piece of wood will equalize the level.) Set these in a flat bottom tin pail and fill with warm water to same level as milk. An inverted pie tin

punched with holes will serve as a stand on which to place the bottles during the heating period.

3. Heat water in pail until the temperature reaches 160° F.; then remove from source of direct heat, cover with a cloth or tin cover and allow the whole to stand for half an hour.

4. Remove bottles of milk and cool them as rapidly as possible without danger to bottles and store in a refrigerator. * * * Milk treated in this way ought to keep perfectly sweet for several days.

For further information as to the handling of milk I beg to refer the reader to Prof. C. D. Smith's Bulletin No. 134, Michigan Experiment Station and the Government Year Book for 1894.

OTHER DISEASE OF CATTLE.

In connection with the communicable diseases of cattle it becomes my unpleasant duty to have to report the prevalence of a disease, brought under my notice last autumn, which from a local standpoint was of a virulent nature, in as much as it destroyed in numerous instances certain glands of the body, notably the udders.

This disease was reported as existing to a considerable extent in Monroe county, and I was directed to investigate it. On proceeding to the point where the report came from I was taken by the health officer to a certain farm. There I examined a number of cattle which had been affected with the disease. It is unfortunate to a certain extent that the disease runs its course with more or less rapidity, and the information I was able to obtain was only such as could be gathered from a casual observer who owned the animals, and who from time to time referred to some of the hired help in answer to some of my questions. This disorder, I may state, was popularly believed to be cow-pox, and while it is possible that future investigation may cause me to form an opinion in accordance with the accepted idea of the locality, I may say that there are some features concerning which differ so much from the ordinary cow-pox that the question has arisen in my mind whether the two diseases are identical.

It is perhaps unfortunate that the bacteriologist is unable with known methods (known to the writer) to diagnose cow-pox. It is true that with the aid of a microscope and other accessories a germ can be shown of a certain description, but a similar if not identical one can be shown under other conditions, which are as far removed from cow-pox as one disease can be removed from another. This defeats the bacteriologist in forming an opinion because he is not able to identify the germ of this disease by any known method. So that we must view the conditions and form our opinions from the evidence we can gather by macroscopical and clinical observation.

Perhaps at this stage and to show the difference between these two diseases as they have presented themselves to me it may be well to describe the salient features of ordinary cow-pox, briefly. In the first place, it usually attacks young animals and the part which is selected for invasion is the udder, although we are informed by far eastern writers that the disease in India sometimes disseminates itself over other parts of the body.

In temperate zones, at all events, the disease usually manifests itself by a faint blush upon the udder which in the majority of instances is to some extent, denuded of hair. This blush soon deepens into a redder tinge and eventually becomes a vesicle, which in its turn, becomes converted into a pustule and the sack, during its progress, becomes umbilicated or cupped, as it were. We may find a numerous group of these vesicles upon each gland or there may be only a few of them. It, as a rule, runs a definite course and all writers that I have consulted state that prognosis should be favorable, indicating thereby that the disease will eventually terminate in resolution and the gland not be interfered with as far as the future is concerned. In the more aggravated cases there may be slight fever, indicated by a rise of temperature, capricious appetite, constipation, and general dullness for a little while. In the course of a few days the pustules will burst and the sore will in favorable cases become a scab and eventually disappear, probably in the course of a couple of weeks after the first manifestation of the symptoms of the disease.

We do, however, find that successive groups of these pustules will make their appearance in which case it will hang about the animal for five or six weeks.

The disease which my attention has been called to the past fall is of a far more virulent nature than the one just described. While I have not had an opportunity to watch its progress from start to finish, yet I have gathered considerable information from the owners of afflicted animals. I have to say that as far as my information is concerned, I have gathered it in various parts of this State as well as neighboring states, all of which I have to add to those cases which I was fortunate enough to see.

This disease usually manifests itself by the cow becoming restless during the operation of milking, and in a great many instances it is difficult, if not impossible, to extract the fluid from her in a proper manner. Then, we soon have the sore upon the udder, which in some instances that were brought under my notice had extended to the teat itself. It was stated to me that these sores were at first small but after a time, say three or four or five days, they became larger until they had assumed, in some instances where I saw them, as great in magnitude as, say a silver dollar. It was my opinion that these massive scabs were the result of smaller ones coalescing or running together.

A remarkable feature in connection with the disorder was its apparent tendency to attack the interior of the gland, and in one animal that I can call to mind, a magnificent Holstein, was affected so badly that my opinion after examining her carefully, was that her udder would never secrete good milk again. The owner, himself, had formed that opinion previous to my visit. Upon this farm I saw ten animals out of about twenty that were seriously affected. In a few instances one-quarter or even two-quarters, might be giving pure milk, but in the majority of cases the cow appeared to me to be practically ruined from the dairy standpoint. The owner stated that he estimated his loss at being as much as $500, and I must admit, after viewing the situation, I thought he was placing a low estimate upon it.

The glands in these cases were hard, indurated masses, reminding one of the feel of a hard, rubber ball, or wooden like, and the small quantity of fluid which could be extracted from them was most unlike good milk, in some instances it being thin and watery, in others pus like, and in still others a good deal of blood was mixed with the discharge.

During the winter months of the year it has been my privilege to address farmers' audiences in various parts of this State, and, feeling that there was more or less disturbance among the dairy cattle of the State, I selected as my topic, "The Milk Gland and its Diseases." At the close of my remarks in every instance that I can call to mind I was asked numerous questions concerning the disorder which I have endeavored to describe. At these meetings I gathered considerable fresh information which led me still further to think the disease might be the result or another cause than that which produces ordinary cow-pox. I was informed by intelligent men that their cows had been affected, and in some instances the affected quarter would assume that condition which is usually spoken of as gangrene, or mortification, and drop off. In other instances the gland would suppurate and large abscesses form which if not lanced would burst of their own accord.

Now, as far as I can learn it is not a common thing, at all events, for ordinary cow-pox to attack the interior of the gland. It is certainly the exception and not the rule, while in the disease which I am speaking about, it was invariably the rule. This marked difference in the two complaints causes me to say that if the disease in question should prove to be occasioned by the same organism, assuming that it is an organism, it was of a most virulent nature, worse than has been described in the writings of any investigator which I have consulted. While this disease is disastrous in its effects if allowed to run its course, yet experience with disorders of this nature has led me to believe that it can be controlled in a manner which would cause the cow to become profitable to her owner from the dairy standpoint; on which account I am inclined to recommend that the disorder should be investigated from a curative point of view, as I believe it has cost farmers of this State many thousands of dollars during the past season.

It appears that the complaint is one which prefers the summer months or early autumn for invasion of the animal. I say this because I have not heard of an outbreak since the cooler weather of the autumn set in.

Like other complaints of this nature the maximum virulence is reached in a certain season, and it is possible the maximum was reached last year, in which case it may decline, and not be so prevalent or disastrous in its effects during the coming season, but it must not be forgotten that the opposite may be the case, and that it may prevail even over a more extended territory.

SHEEP.

Reports concerning this species of domestic animal indicate that serious disorders of them are quite prevalent throughout the State. While I have done a good deal of correspondence with the owners, thus pursuing my investigations at arm's length as it were, yet I have had sufficient personal investigation to show that the disorders of these animals are worthy of most careful consideration.

During my investigations I have discovered no less than five different parasites invading certain parts of these animals; three of them confining their ravages to the bowels, while the remaining two prefer the lungs for invasion. Those which attack the bowels are by far the most prevalent, the ones which attack the lungs having only made their appearance in a few instances.

EXPLANATION.

TÆNIA *Expansa*, Rud.

Plate I.

Figs. 1 and 2. Young tape-worms, natural size.
Fig. 3. Head end of tape-worm, drawn to show vermicular contractions when living.
Fig. 4. Head, top view: *a*, *a*, the suckers or cups, by which the worm attaches itself to the intestinal walls.
Fig. 5. Head, side view: *a*, *a*, suckers; *b*, *b*, folds in the neck; *c*, *c*, the first segments.
Fig. 6. The large end of a young tape-worm: *a*, *a*, segments which are not mature enough to drop off; *b*, *b*, segments ready to pass away from the worm.
Fig. 7. Segments, or proglottides found, separate from the worm.
Fig. 8. An adult tape-worm, drawn in sections at regular intervals apart: *a*, head.
Fig. 9. A fragment of another worm, which is not only slightly larger, but whose segments are shorter and broader.

The specimen shown in fig. 8 could have assumed very much the same form when alive as is seen in fig. 9.

EXPLANATION.

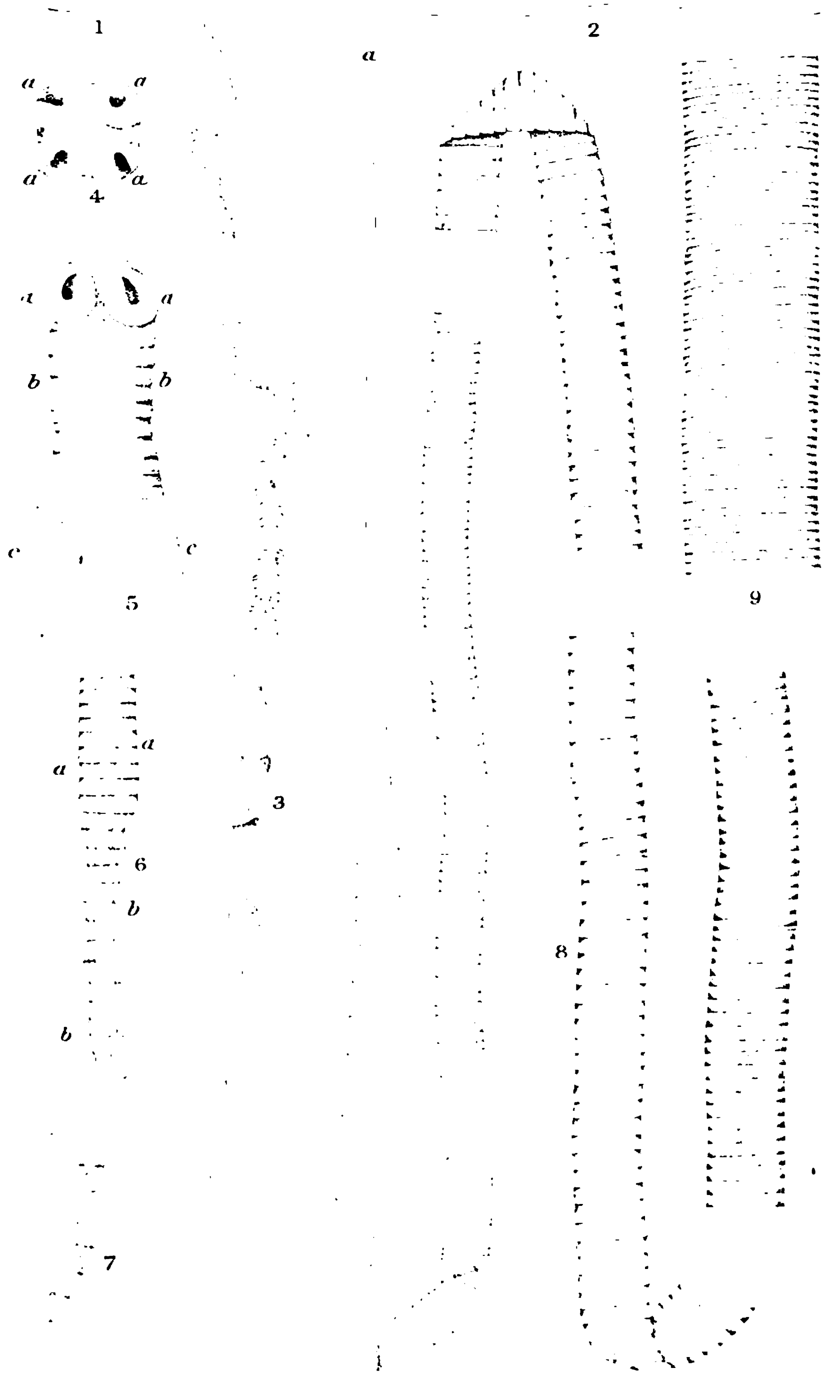
TÆNIA EXPANSA EMBRYOS.

Plate II.

Fig. 1. Embryos magnified and flattened under cover-glass.
Fig. 2. A single embryo and its envelopes somewhat flattened.
Fig. 3. The same greatly flattened: *a*, the thick, oily mass between the inner and outer covering.
Fig. 4. The same with outer envelope ruptured: *a*, the outer envelope; *b*, the inner; *c*, oil globules; *d*, the embryo and its pyriform apparatus.
Fig. 5. Embryo, with three envelopes.
Fig. 6. Embryo escaped from ruptured inner coat: *a*, the fringed cap-like covering; *b*, the bladder-like sac protruding from it; *c*, the six-hooked embryo.
Fig. 7. A younger embryo, in which the bladder portion has not burst from the cap; *a*, the cap; *b*, the embryo.
Fig. 8. Three young *tænia* which show no trace of segmentation.
Fig. 9. A young *tænia* which is beginning to segment.
Fig. 10. A head of young specimen showing a peculiar loop in it.

First amongst those which attack the bowels is a tape worm known to science as *Tænia Expansa* (Plates I-II). I have invariably found this worm in the small bowel, and, according to my investigation, it has varied in length from one foot to fifteen feet and has been about a half inch in width at its widest part, tapering gradually towards the end, the head being considerably smaller than any other part. It is made up of

PLATE I.



Geo. Marx, del.

A.Hoen & Co Lith. Baltimore.

TAENIA EXPANSA,
(The Broad Tape-Worm.)

PLATE II.

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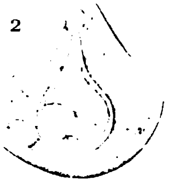

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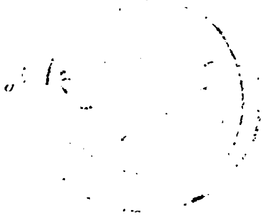

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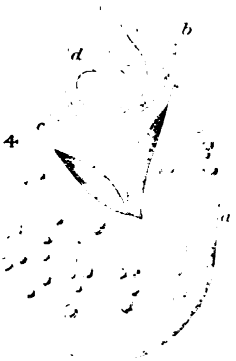

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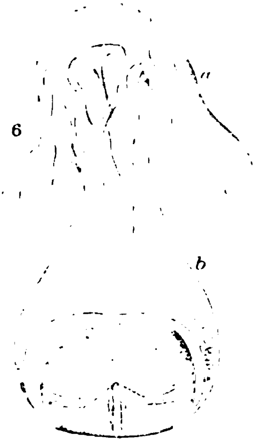

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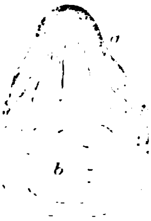

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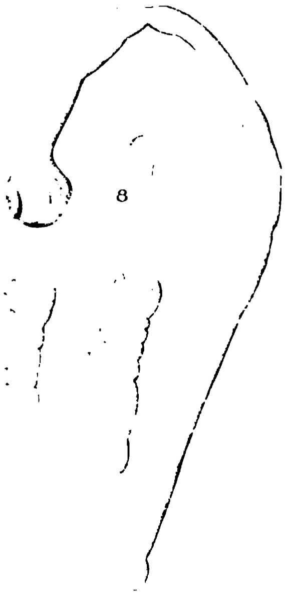

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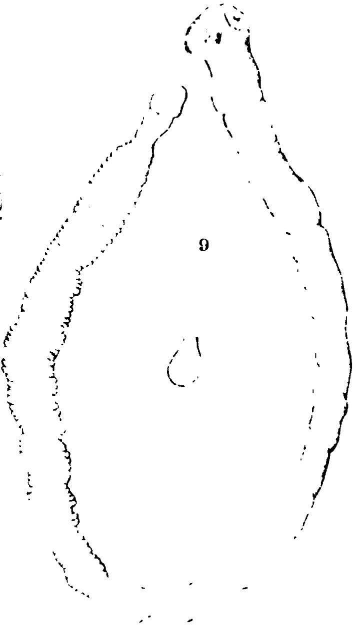

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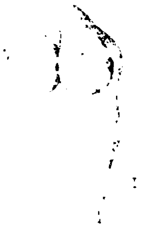


Geo. Marx, del.

TAENIA EXPANSA,
(Young Stages.)

A. Hoen & Co Lith Baltimore

innumerable segments which, when passed through the bowels, sometimes appear single, and resemble little white maggots as they adhere to the droppings from the animal. Sometimes several feet of a chain of maggots as they appear will be voided at one time. This paracite has been more or less investigated by the Bureau of Animal Industry at Washington, and to it we are indebted for the following description:

"The entire worm measures about 5 yards in length, its width varying from 1-25 of an inch to ¼ of an inch, its thickness being about 1-10 of an inch, the dimensions greatly depending upon the contracting condition of the worm when measured and on its state of preservation. An adult specimen taken from the sheep may measure less than four yards or may slightly exceed five, but they never, in this country at least, attain that gigantic measurement of 100 feet ascribed to them by European observers. The head is somewhat larger than the neck and measures 1-25 of an inch in width. It is smooth on the end and has four suckers directed anteriorly. Its neck, or that portion of the worm immediately succeeding the head, which is segmented, is short or lacking. The body of the worm is apparently made up of a series of very short but extremely wide joints, which vary in length and width in the successive portions of the body. The first rings of the tænia are very short and narrow, others are longer but are also broader than long. Those segments which are about two-thirds the entire length from the head are the longest. From these to the end they become gradually shorter and wider. In width, the segments gradually increase from the head to the end. When first procured the texture of the worm is usually opaque and white, and it is only by allowing them to stand in water that they become transparent enough for study. It can then be seen that each segment is bilaterally symmetrical, that in each half is an independent set of genital organs. These become apparent at a little distance from the head and show in their best development about half the entire length from the head. From this point on, the segments become more and more opaque to the end."

The rest of the description of the worm is so technical that it is perhaps unnecessary for me to describe it here. Should the reader desire, however, to follow this question further, let him refer to page 114 of "The Animal Parasites of Sheep," by Dr. Curtice of Bureau of Animal Industry, Washington, D. C.

DISTRIBUTION OF THE WORM.

I have heard of this worm being distributed in many sections of the United States as well as Canada. Indeed, it is one of the best known of the internal parasites of sheep, and is more abundant in summer and early fall than any other season of the year. The prevalence of it in sheep was first brought under my notice in 1892 when some sheep were sent to me from Lake View in this State, which were supposed to be suffering from some mysterious disease. From any account which I have been able to obtain, it would appear that the disease had not been recognized in this State previous to that time, although it is highly probable that it invaded sheep for many years previous. It is believed to have been introduced into this country with sheep which harbored it, and has been passed along from them to others year after year.

With regard to the life history of this kind of parasite it may be interesting to note that as a rule it requires two animals before the circulation or life history is complete. The one in which the worm exists as a tapeworm is called the host, while the other animal in which it exists as a little sac is called the intermediate host. In some instances the intermediate host has not been discovered, and it may be that in these instances it is not necessary that an intermediate host should exist.

From a somewhat extended experiment conducted by Dr. Curtice it appears that an intermediate host is not absolutely necessary in the case of tænia expansa. He states, amongst other things, in his investigations, that the life history is only incomplete in that portion of the life of the worm which it passes outside of the life of the host. Just exactly what happens to the embryo containing the egg between the time that it escapes until it is again found in the sheep as a little head with four suckers and a short tail-like appendage, is not known, but may be inferred with some degree of accuracy. It is not possible to develop the embryo in water, or feed them and produce an infection in sheep. So it has been suggested that these forms may pass a portion of their existence in some of the minute animals or insects which inhabit the grass and water of sheep farms. But it has not been proven that this is necessary, and it has been stated that the disease has been found in sheep which have been fed entirely in stalls, but usually in the youngest of the flock.

Whatever may be the accurate life history of this parasite, it is important to recognize the disease in its earliest stages, for experience has led the writer to believe that the adoption of curative measures in proper time will save many if not all animals which might be affected with it.

The disease may be discovered by finding little white, oblong tapeworm segments, resembling maggots or two or more maggots gummed together, as it were. These segments adhere tenaciously to the droppings of the animal, but it must be remembered that these segments are only found after the tapeworm has become fully grown, when it sheds its joints. The sheep or lamb, oftener the latter, may be affected with a variety of enteric or bowel symptoms. Sometimes the creature becomes much dejected and will hang behind the flock, the mucous membrane lining the nose and eyes becoming pale in color, the fleece dry and harsh. The animal will often walk with a staggering gait, and things go from bad to worse until the poor creature grows weaker and weaker, diarrhœa sets in, which becomes more and more pronounced until death closes the scene.

The presence of the worm cannot always be recognized by symptoms, and it is perhaps unfortunate, as we are obliged to recommend a line of treatment without actually knowing that the disease does exist; but fortunately the line of treatment which we shall recommend will not do harm to the animal although the parasite may not be there, so that we have lost nothing except our time in administering the medicine, and the cost of it, the latter is very trivial.

To illustrate how far the disease may go without manifesting itself by symptoms, I can call to mind having visited a flock, a number of which were believed to have previously died of this disease. There were about sixteen lambs in a lane, all of them vigorous and in the best of spirits.

I suggested to a good judge of sheep who was with me that he might pick out the most vigorous one of the lot to see if it had the disease, the animal being finally selected. We killed it and held a post-mortem. I laid open one of the smaller bowels and there I counted nine immature tapeworms, lying side by side. It is true that they had not developed to that extent that they caused the creature any particular inconvenience, but from experience one might say that nothing could be more certain than the death of that sheep from tapeworm, provided matters were permitted to run their usual course.

TREATMENT.

Before giving the sheep worm remedies it may be well to prepare them by withholding a certain amount, say half of the feed the night before the medicine is to be given, and the remedy is thought to be still more effectual if the animal is stinted in its water for at least twelve hours before the medicine is given. Fluids should be given at one dose and the animal should be allowed time to swallow it slowly. It is better not to turn them out after the medicine has been given, and the more they are watched to see if worms are voided, the better. If worms are not voided after the first dose, it may be repeated the second day, and I have repeated it even a third time, allowing a day or two to intervene.

The medicine which I have used and give preference to is spirits of turpentine, which may be prepared for administration by taking one part of the turpentine and adding to it sixteen parts of sweet milk. Shake this well and use as a drench. The dose of the mixture for lambs from three to six months old is about two ounces; six months to a year old about three ounces, and from a year old upwards about four ounces. I have occasionally given larger doses than these, increasing them about a half, without any apparent ill effect; indeed, in some instances, I have thought that the larger dose was more effectual. One dose will often be sufficient, but if it is not, repeat as above described.

To give the medicine, let a careful assistant place the animal upon its haunches, holding the body between his knees with the face outwards. The mouth should be gently opened by pressing the thumb on one side and the fingers on the other around the lower jaw. The medicine should then be poured slowly in, from a long necked bottle. If the animal exhibits any desire to cough, let the head go immediately and let it recover from the cough before attempting to give any more of the dose. The coughing indicates that a few drops of the medicine have gone the wrong way, and if we persevere in pouring it down under such conditions we may do more harm than good.

Many other remedies have been recommended. Pumpkin seeds, among other things, have been highly extolled; but my experience with them has been anything but flattering to the drug. Powdered areca nut has been recommended for tapeworm, but I cannot say that it has proved as effectual as the turpentine in my hands. Oil of male fern in doses of ten to twenty drops, given in a little molasses and water, and followed the next day by a purgative, say two to four ounces of castor oil, is good. Many tapeworm remedies are recommended, but it must be remembered that to be effectual in saving the life of a large percentage of the animals they must be given before the parasites have weakened the constitution of the host, to that extent that it is unable to battle against the various difficulties which usually accompany such disorders, in the shape of general debility, diarrhœa, and the like.

For a description of the tœnia expansa in its various forms let me refer the reader to plates Nos. 1 and 2, to which are attached explanatory notes.

EXPLANATION.

STRONGYLUS CONTORTUS, Rud.

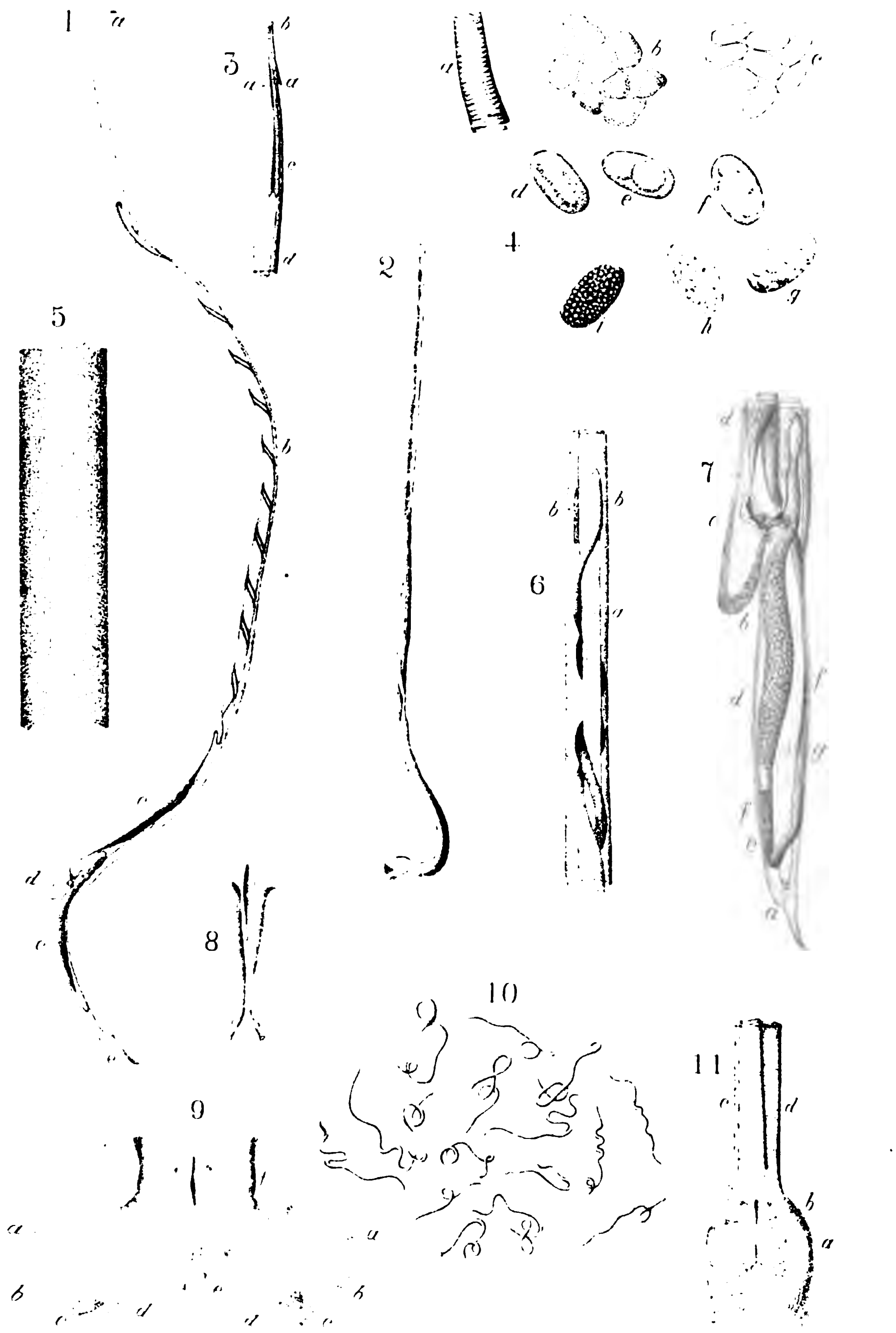
Plate III.

Fig. 1. Adult female, ×6; *a*, head; *b*, ovaries wound around the intestines; *c*, *c*, uteri; *d*, a large papillæ, just in front of and covering the vulva; *e*, anus.
Fig. 2. Adult male, ×6.
Fig. 3. Head; *a*, two barb-like papillæ; *b*, mouth; *c*, œsophagus; *d*, intestine.
Fig. 4. Eggs, highly magnified: *a*, eggs before they have left the ovaries; *b*, eggs showing nuclei; *c*, eggs after they have passed through the oviduct; *d*, egg with one cell; *e*, with two; *f*, with four; *g*, with eight; *h*, with many; *i*, egg as it is laid.
Fig. 5. Skin, showing nine of the eighteen longitudinal lines.
Fig. 6. Portion of female: *a*, the intestine; *b*, *b*, the ends of the ovaries.
Fig. 7. Caudal end of female: *a*, the annus; *b*, the vulva; *c*, vagina; *d*, *d*, uteri filled with eggs; *e*, oviduct; *f*, *f*, ovary; *g*, intestine.
Fig. 8. Spicula, enlarged.
Fig. 9. Bursa, expanded to show costæ: *a*, ventral; *b*, ventro-lateral; *c*, lateral; *d*, dorso-lateral; *e*, dorsal; *f*, spicula.
Fig. 10. Group of adult males and females, natural size.
Fig. 11. Caudal end of male: *a*, bursa; *b*, spicula; *c*, seminal reservoir; *d*, intestine.

Strongylus contortus is a round worm found in sheep in many parts of Michigan, in some instances creating sad havoc in the animal which they attack. It appears to prefer the fourth stomach of the animal as its habitat rather than any other part of the economy. The disorder produced by this worm is familiarly known in the more southern latitudes of this country as Lombriz, a somewhat ambiguous term, inasmuch as it is a Spanish word meaning a worm. The parasite produces characteristic symptoms which can be recognized with more or less certainty by those who are familiar with the disorder, although it is perhaps unfortunate that they closely resemble the symptoms produced by other worms in the intestines, and, indeed, are often accompanied with other worms, so that it becomes a matter of some difficulty for the veterinarian to decide which of the two is producing the greater disturbance.

The sheep which is affected with them will be seen to hang behind the rest of the flock and have a marked expression of general languor. The head will hang and ears will droop, there will also be an expression of general debility. The bowels will frequently be costive but in many instances give way to diarrhœa; the appetite of the animal will be capricious. In some instances I have noticed extreme prostration, even to that extent that the animal lay upon its side, little more than a lifeless mass.

PLATE III.

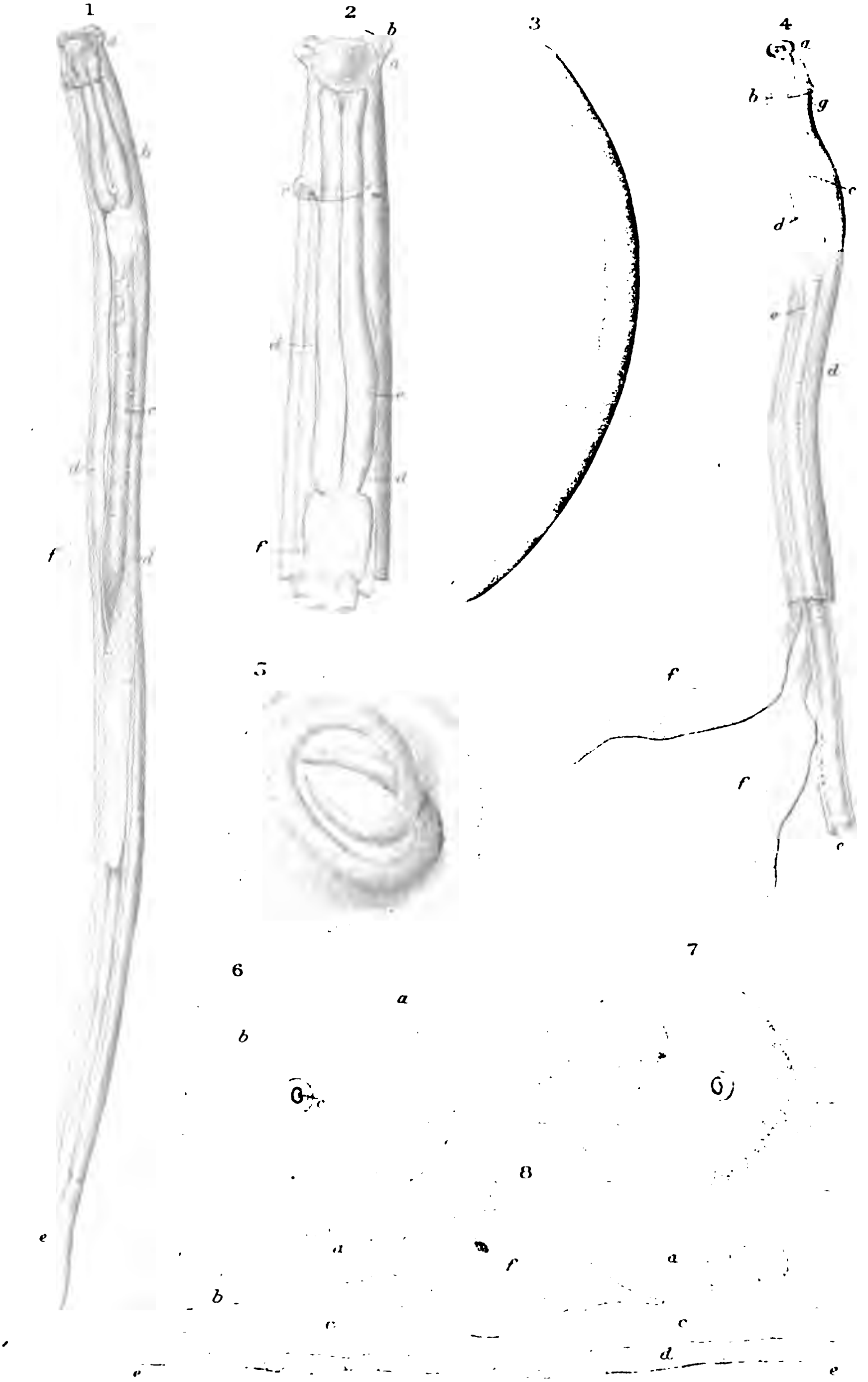


Geo. Marx, del.

A. Hoen & Co. Lith. Baltimore.

STRONGYLUS CONTORTUS,
(The Twisted Stomach Worm.)

PLATE IV.



Haines, del.

A. Hoen & Co. Lith. Baltimore.

ŒSOPHAGOSTOMA COLUMBIANUM,
(Young Stages.)

If there is a special desire to diagnose the disease with more certainty, a careful examination of the fæcal discharges from the animal, by the aid of an ordinary magnifying glass will sometimes reveal the presence of the worm. Should it not be found and the animal eventually die from an unknown complaint, a post mortem should be held and attention directed to the fourth stomach where, if these worms are the cause, they will be found in vast numbers; their movements can be readily detected as they wiggle about in the organ, appearing to some extent as if attached to the mucous membrane of it. Those that I have observed present a somewhat chocolate hue and look like so many brown hairs about, say for convenience sake, an inch and a half long. They vary considerably, however, as far as their length is concerned.

LIFE HISTORY.

It is believed that sheep contract this disorder by consuming the eggs which fall to the ground along with the worms which have infected other sheep and that when these eggs arrive at the fourth stomach of the sheep, finding a suitable habitat, they develop there. A description of the parasite is exhibited on plate No. 3.

TREATMENT.

I have found the spirits of turpentine and milk more effectual with this disease than any other agent which I have used. Add one part of spirits of turpentine to 16 parts of milk. Dose two to four ounces for each animal, according to the age of the patient, repeated in two days if necessary, and again in two days after that. The disease may be prevented to a large extent by requiring sheep to eat out of mangers and drink from troughs which have not been contaminated by affected sheep. The medicine should be administered in the same manner as was described in the last disease.

NODULAR DISEASE OF THE INTESTINES.—PLATES IV-V.

EXPLANATION.

ÆSOPHAGOSTOMA COLUMBIANUM, Curtice.

Plate IV.

Fig. 1. Worm in third stage, ×60: *a*, head, with chitinous armature; *b*, œsophagus; *c*, intestine; *d*, unicellular glands; *e*, anus; *f*, line denoting natural length.

Fig. 2. Cephalic end, lateral view, ×150: *a*, chitinous cup; *b*, one of the six cephalic papillæ, (these are slightly distorted); *c*, side view of the neck-fold, under which the gland-ducts, *d*, *d*, open on the ventral line; *e*, œsophagus; *f*, intestine.

Fig. 3. Worm in first stage when 0.23 mm. long. No internal organs were seen in this specimen.

Fig. 4. Cephalic end, ventral view: *a*, head; *b*, neck-fold, near, which are the neck papillæ *g*, *g*; *c*, œsophagus; *d*, *d*, unicellular glands, which open under the fold *b*; *e*. intestine; *f*, *f*, glands.

Fig. 5. Worm inclosed in its cyst.

Fig. 6. Tumor from which the cyst in Fig. 5 was taken: *a*, surrounding tissue dissected from cæcum; *b*, fluid-filled space; *c*, capsule with inclosed worm.

Fig. 7. Older tumor. This differs from tumor of Fig. 6, in having a movable cheesy mass. These tumors are distorted by compression, which makes them too flat. Figs. 6 and 7, and Fig. 3, Plate XXVI, present three stages in the disease, as seen in fresh tissues under low magnifying powers.

Fig. 8. Section of an advanced tumor: *a*, mucous membrane; *b*, submucous; *c*, inner muscular layer; *d*, outer; *e*, serous membrane; *f*, the cheesy mass of the tumor in which is a small section of the worm. This presents a more advanced stage of the disease than Fig. 2, Plate XXVI.

EXPLANATION.

ÆSOPHAGOSTOMA COLUMBIANUM, Curtice.

Plate V.

Fig. 1. A piece of mucous membrane taken from the cæcum, surface view, natural size. The patch of dots scattered uniformly over the surface represents intestinal glands; the irregularly scattered larger dots and elevations are the young worm tumors in their first stages.

Fig. 2. A section through a worm tumor in its younger stage: *a*, *a*, *a*, mucous membrane; *b*, submucous connective tissue, in which are *c* arteries and *d* veins; *e*, the tumor, which is made of connective tissue cells and their nuclei, packed closely together; near its center is the worm cavity *f*, with a piece of the worm, which is surrounded by a section of a special capsule; outside of this is a thick membrane, formed from the surrounding material.

Fig. 3. Small tumor dissected from the cæcum: *a*, the outside capsule filled with fluid, in which is *b*, a hard, cheesy mass; *c*, the worm in its capsule, which has been pressed out of the cavity in the mass *b*. This presents a more advanced stage of the disease than Fig. 7, Plate XXV.

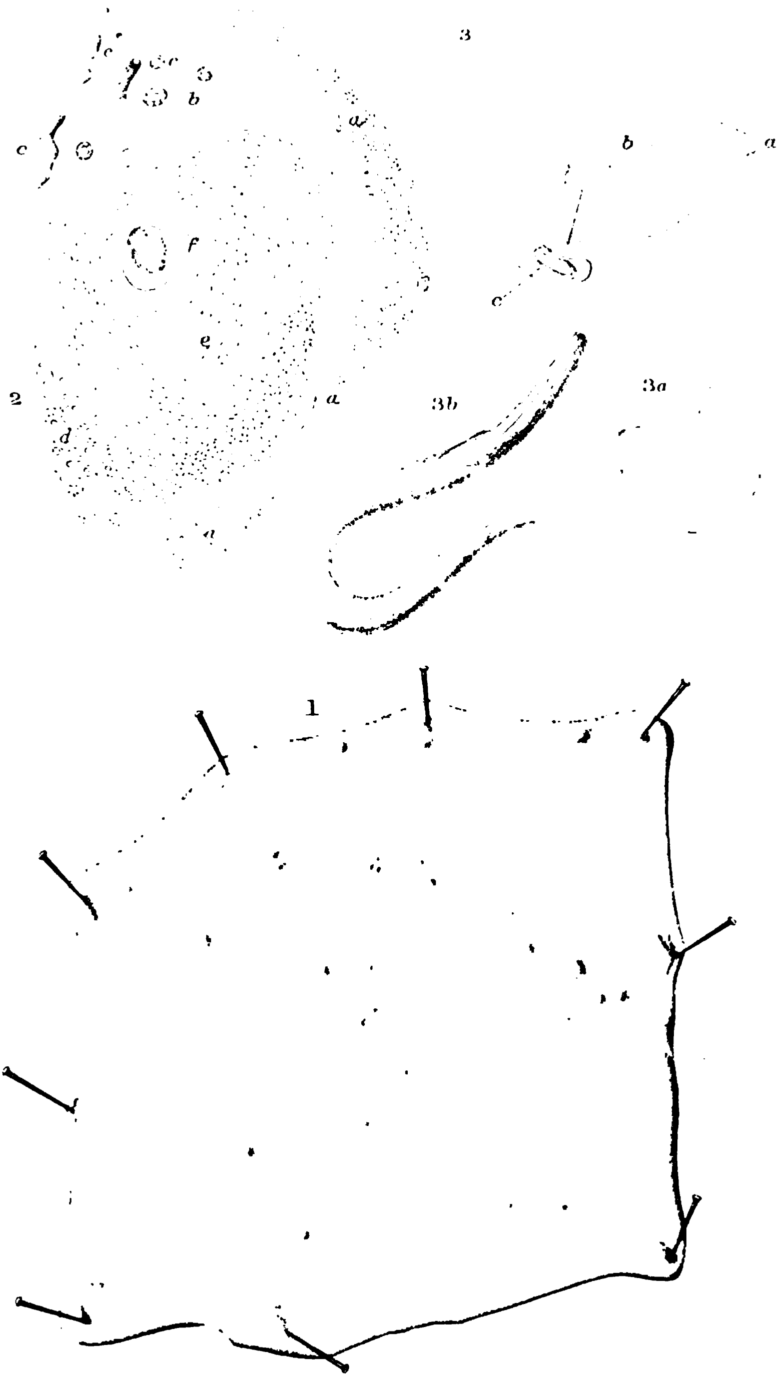
Fig. 3*a*. The ruptured capsule.

Fig. 3*b*. The worm near the end of its second stage about to moult.

On several occasions I have been consulted concerning an outbreak of disease in sheep, the owners stating that the animals seemed to sicken and die without any apparent cause. I have in some instances investigated these outbreaks and have found the walls of the bowels from beginning to end, affected with a peculiar beaded appearance which was most striking. I have noticed that by drawing the small bowel through the fingers a sensation would be produced upon them which would remind one of a string of beads where the beads were a few inches apart. In other instances the nodule will assume considerable dimensions, being as large as a bean. When cut into the nodules will be noticed to contain green, cheesy like substance, which has reminded me in some instances of the meat of the green pea. This disease may invade the economy of an animal to a considerable extent without apparently doing much harm. But when the bowels are as badly affected as I have seen them it is pretty evident to me that they were the cause of the sickness and death of the animal.

It is quite unfortunate that we cannot diagnose this disease with anything like certainty during the life of the animal. Having found it in

PLATE V.



Haines, del.

A Hoen & Co. Lithocaustic, Baltimore

ŒSOPHAGOSTOMA COLUMBIANUM.
(Small Tumors of Cæcum.)

some dead creatures our suspicions might be aroused, knowing that the whole flock had been treated about alike as far as external surroundings were concerned, so the exposure would be practically the same in all individuals. The worm causing this disorder may be found in the nodule by means of an ordinary, low-power, magnifying glass.

The worm may be discovered by allowing the greenish, cheesy contents of the nodule to escape into a watch glass containing some water, when, by careful teasing the apparent newer portion of these masses a little worm can usually be detected which is believed to be the cause of this disease. The disorder usually causes a species of indigestion which in its turn will materially interfere with the condition of the animal, causing it to become poorer. In a general way it may be inferred that sheep which become unthrifty, dyspeptic looking objects, exhibiting general debility and a marked tendency to diarrhœa on the slightest provocation are no doubt affected with this disease; therefore when sheep are found not to be doing well we have good reason for suspecting this disease. For further description of the complaint I will call the reader's attention to plates Nos. 4 and 5 with their descriptions.

TREATMENT.

This disease has not been investigated from a curative standpoint sufficiently to enable the writer to speak with anything like encouragement so far as individual medicines are concerned in overcoming it, although experience with like disorders suggests that treatment may profitably be applied, once we discover a specific for these organisms, but the remedy should, no doubt, be used in the early stage of the disorder before it has time to weaken the constitution of the animal to such an extent that it might be doubtful if it would regain its original tone even supposing the parasite was destroyed. It is probable, however, that some of the remedies used for intestinal parasites will answer very well for this if given in time.

PREVENTION.

As the disease is believed to be disseminated or spread from animal to animal by eggs dropping to the ground from affected sheep and taken from the pastures or dinking water by healthy animals, the cutting off of this means of circulation is a certain way of preventing this disorder, and sheep which are known to be healthy should be kept on new pastures by themselves and required to drink from troughs which have not been contaminated by diseased animals. If the sheep are fed from troughs instead of the ground the chances of dissemination of the complaint are reduced to a minimum.

LUNG WORMS IN SHEEP.

In one or two instance my attention has been called to flocks of sheep which exhibited certain peculiar symptoms, to wit.: The animals would possibly be lying quietly on the ground without suffering any unusual inconvenience, but if required to rise somewhat suddenly a paroxysm of coughing would be brought on and the creature would, in some instances, suffer great inconvenience thereby, even to the extent that it would be threatened with suffocation. The animals would be debilitated more or less according to the severity of the attack. The disease is usually found in young animals, is sometimes called verminous bronchitis, it being dependent upon worms in the bronchial tubes which irritate them under certain conditions to that extent that the cough previously alluded to, will be brought on. Not only this but the animals are often poorly nourished and may have a copious nasal discharge in which fragments of the worms can occasionally be discovered. The wool is easily pulled off, exhibiting a white, bloodless skin underneath, which peculiar appearance has given rise to the name "paper skin disease." The parasite which causes this disorder is technically called the *strongylus filaria*.

TREATMENT.

Of all the remedies which have been used by the writer preference is given to turpentine. It is known to those who study the actions of drugs that turpentine is eliminated from the system to some extent by the lungs. During its passage through these organs it has a very baneful effect upon the lower forms of animal life which may invade them, and no doubt causes their destruction. The medicine may be administered in the same doses and in the same manner as recommended for worms in other parts of this report. I have on some occasions resorted to the fumigation of the bronchial tubes with fumes of sulphur and while if judiciously applied it will have a good effect, great care must be taken that this line of treatment is not over-done as by so doing more harm than good is likely to result.

Another worm which invades the lungs of sheep is *strongylus ovis-pulmonalis*. It seems to invade the lung substance itself and gives rise to a disease which, to a casual observer, resembles tuberculosis very much indeed, there being nodules of variable size on the surface of the lung which in some instances contain pus. The nodules resemble very much the miliary appearance of tuberculosis. These two lung diseases often accompany one another and are overcome by the same kind of treatment, but it must be admitted that prevention is better than cure, and if the locality is free from the disorder the greatest care should be taken to keep the disease out, which can only be done by placing certain restrictions in the shape of quarantine upon new importations; and strange sheep, if permitted in the locality, should be kept by themselves for a month or two and if found affected with any disease of the verminous or worm-like nature the pasture upon which they have run during the quarantine season should not be used for healthy sheep for a season or so.

In preparing this report I have reviewed some of the literature of the various subjects, and selected many passages that seemed to be of practical importance and interest which I have taken the liberty of compiling along with my own experience of the different subjects treated upon.

In case I should not have given the authors of my quotations due credit at the proper time, I here beg to mention such admirable works as Buck's Hand Book of Medical Science, Sternberg's Bacteriology, various contributions from the Bureau of Animal Industry, Experiment Station Bulletins, Crookshank's Bacteriology, recent edition, to which I would refer the reader should he desire to follow these questions further.

In closing I desire to express much gratitude for the courtesy which has been extended to me on all occasions while in pursuit of my duties.

E. A. A. GRANGE,
State Veterinarian.

STATE OF MICHIGAN

LAND DEPARTMENT

REPORT OF THE COMMISSIONER FOR THE FISCAL YEAR ENDING JUNE 30, 1896

STATE LAND OFFICE.

WILLIAM A. FRENCH,	State Land Commissioner
BURTON PARKER,	Deputy Land Commissioner
JOHN F. WILKINSON,	Chief Clerk
HENRY WHITELEY,	Bookkeeper
JAMES I. BERRY,	Draughtsman

COMMISSIONERS OF STATE LAND OFFICE AND TERMS OF OFFICE.

APPOINTED.

DIGBY V. BELL,	**February 2, 1844–1846**
ABIEL SILVER,	**February 16, 1846–1850**
PORTER KIBBEE,	**April 2, 1850–1850**

ELECTED.

PORTER KIBBEE,	**1851–1854**
SEYMOUR B. TREADWELL,	**1855–1858**
JAMES W. SANBORN,	**1859–1860**
SAMUEL S. LACEY,	**1861–1864**
CYRUS HEWITT,	**1865–1866**
BENJAMIN D. PRITCHARD,	**1867–1870**
CHARLES A. EDMUNDS,	**1871–1872**
LEVERETT A. CLAPP,	**1873–1876**
BENJAMIN F. PARTRIDGE,	**1877–1878**
JAMES M. NEASMITH,	**1879–1882**
MINOR S. NEWELL,	**1883–1886**
ROSCOE D. DIX,	**1887–1890**
GEORGE T. SHAFFER,	**1891–1892**
JOHN G. BERRY,	**1893 to March 20, 1894**
WILLIAM A. FRENCH,	**March 20, 1894–**

REPORT.

Michigan State Land Office,
Lansing, June 30, 1896.

Hon. John T. Rich, *Governor of Michigan*:

Sir—In compliance with the provisions of law establishing the State Land Office, I have the honor to submit herewith, for your consideration and for reference to the Legislature, a report of the transactions of this department for the fiscal year ending June 30, 1896, being the fifty-fourth annual report of the state land Commissioner:

The whole number of acres of land held by the State, at the close of business June 30, 1895	423,889.83
Number of acres of part-paid land forfeited to the State during the year	836.01
Number of acres of swamp homestead land forfeited to the State during the year	5,016.28
Number of acres deeded to the State by the Auditor General, under the provisions of section 127 et seq., act 206, laws of 1893	*211,823.10
Number of acres deeded to the State by George W. Webber, under resolution 16, laws 1895	1,213.37
Total	642,778.59

Total number of acres sold during the year	14,988.16
Total number of acres of swamp land licensed	6,207.19
Total number of acres entered as homestead land, under the provisions of section 127, et seq., act 206, laws of 1893	40,125.49
Total number of acres held for sale and homestead entry, June 30, 1896	581,457.75
Total	642,778.59

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* Note.—The Auditor General's records show a transfer, under the act, of 211,731.49 acres. This discrepancy arises from placing the tracts upon the records of this office under the correct acreage as shown by the government surveys, where deeds have been issued with the acreage given according to returns of the township and county officers.

The lands held by the State June 30, 1896, are classified as follows:

Primary school land	200,721.61
University land	40.00
Agricultural college land	99,872.45
Salt spring land	400.00
Asylum land	1,162.98
Swamp land	107,563.10
Tax homestead land	171,697.61
Total	581,457.75

The number of acres of land of the different classes disposed of during the year, and the amount received therefor in cash, and the amounts due thereon, is as follows:

Class of land.	Acres.	Amount sold for.	Amount paid.	Amount due.
Primary school land	7,877.07	$31,008 28	$25,968 47	$5,039 81
Agricultural college land	1,938.21	15,632 24	12,122 76	3,509 48
Swamp land	4,295.43	5,927 90	5,128 84	799 06
Salt spring land	40.00	160 00	80 00	80 00
University land	40.00	480 00	240 00	240 00
Patent to homesteaders	797.45			
Totals	14,988.16	$53,208 42	$43,540 07	$9,668 35

The number of acres of the different classes forfeited to the State for non-payment of interest is as follows:

Primary school land	582.77
Agricultural college land	160.00
Total	742.77

The receipts of the State Land Office, on account of lands sold during the year, and for principal, interest and penalty received on sales made in former years, and from other sources, have been as follows:

Primary school land—principal	$36,444 26	
Interest	10,049 80	
Penalty	355 32	
		$46,849 38
University land—principal	$290 00	
Interest	1,417 51	
Penalty	21 13	
		1,728 64
Agricultural college land—principal	$16,714 49	
Interest	5,105 45	
Penalty	340 30	
		22,160 24

Salt Spring land—principal	$408 14	
Interest	88 67	
Penalty	2 80	
		$449 61
Asylum land—principal	$1 00	
Interest	217 26	
Penalty	6 01	
		224 27
Swamp land—principal	$4,906 88	
Interest	516 37	
Penalty	37 86	
		5,461 11
Normal school land—principal	$180 00	
Interest	312 35	
Penalty	14 82	
		507 17
Dewey asset land—principal	$100 00	
Interest	78 87	
Penalty		
		178 87
State building land—principal	$202 53	
Interest	161 10	
Penalty		
		363 63
Taxes on part-paid lands		1,843 63
Fees for plats, etc.		969 76
Trespass collections		2,993 32
Rent of Lansing lots		1 00
Homestead fees		212 46
Bids, swamp land		50 00
Payments on tax homesteads		4,203 94
Total		$88,247 03

SWAMP LAND.

The total sales of swamp land during the year have amounted to 4,295.43 acres, for which there was paid in cash $5,128.84, and part-paid certificates issued for a balance due the State of $799.06. As compared with last year, this shows a falling off of cash receipts to the amount of $1,364.89, with 438.28 acres reduction in the total sales.

In the report of 1895 attention was called to the two cases of the State of Michigan, decided by the Secretary of the Interior, in one of which (State v. Heirs of Thomas Powers, 19 L. D., 223) the secretary held the State's claim under a resurvey valid, "if, in fact, the land was of the character contemplated in the swamp land act," and in a subsequent decision (State v. McKeon) reversed his former opinion, and held certain descriptions of the same character for rejection. Motion for a rehearing was made by the State's attorneys and from recent communication with them it is confidently believed that the opinion laid down in the Powers case will be reaffirmed in the case of State v. McKeon and claims of a similar nature. If such decision is made, and adhered to, it will result in a favorable adjustment of our claim to many thousand acres under the swamp land grant of 1850.

The suit of the State v. H. H. Warner, et al. was tried in the U. S. circuit court for the eastern district of Michigan last February, and a decision rendered against the State. On motion for rehearing the court held the case was one requiring judicial determination in a State and not a United States court. The case will come on for trial during the winter, as the greater number of the State's witnesses are sailors, now employed on the lakes, who cannot be reached during the season of navigation on the great lakes. If the real value of the "Middle Grounds" was the sole cause of litigation there would be no disposition on my part to urge a further prosecution of this suit. The tract has been set aside by act of the legislature as a public shooting ground, and embraces a large body of low marshy ground, for the most part unfit for cultivation, surrounded by rice fields and practically valueless, except for fishing and shooting. But the claim of the State to all swamp and overflowed land, under act of congress, extends to this tract, and we cannot well permit its appropriation by Mr. Warner or others without surrendering the principles for which we are contending before the interior department in the determination of claims for swamp lands.

AGRICULTURAL COLLEGE LANDS.

During the year there have been sold 1,938.21 acres of Agricultural college land, for which $12,122.76 has been received and part-paid certificates for $3,509.48 have been issued. All college lands west of the principal meridian have been restored to market by order of the State board of agriculture, and the balance of the land will be ready to place in market at an early day. This land has been reappraised by the board, from data furnished by their special examiner.

PRIMARY SCHOOL LANDS.

The past year shows an increased sale of primary school land over the year ending June 30, 1895. During the past twelve months 7,877.07 acres have been sold and $25,968.47 received in payment, with part-paid certificates to the amount of $5,039.81 issued. This is 3,517.09 acres in excess of sales for 1895.

TAX HOMESTEAD LANDS.

Seventy-seven townships in twenty-two counties of the State, have taken advantage of the provisions of section 127 et seq., act 206, laws of 1893. Under the provisions of this act, 211,823.10 acres of tax lands have been deeded to the State by the Auditor General; 171,697.61 acres remain subject to entry, and 40,125.49 acres have been taken as homesteads. The number of acres of this class of land taken for the purpose of homestead, during the first year of the practical operation of the law, is more than double the number of acres of swamp land outstanding licensed; more than six times the number of acres of swamp land licensed as homesteads during the past year, and exceeds by more than 5,000 acres the total sales of all classes of State land for the five years last past.

Under the provisions of this act, lands delinquent for taxes and bid off to the State for a consecutive period of more than three years have been examined, on request of the township boards, and the expenses of such examinations have been paid by the State. Books, plats and circulars have been prepared and the work systematized so as best to carry out the provisions and the intent of the act. A complete list of the lands has been prepared and printed from time to time to send out on application, in order that those seeking homes need be to the expense only of selecting the land they wanted and the payment of the required ten cents per acre down. No real estate tax is required to be paid during the five years the land is held under homestead certificate, and the small payment of ten cents per acre for each year of the homestead term gives to the settler in a short time a farm and a home on the "easy payment" plan that is neither a sacrifice or a burden. "I have more muscle than money," writes one man, and "I want a home." These are the men the State is sending into these barren places, men of energy and muscle; men who will, in a few years, make gardens in the wilderness, build school houses and churches, add health and wealth and vitality to the communities, and rear families that will grow up into manhood and womanhood with a high patriotic love for the State that gave to their fathers and mothers, not as a charity, but as a legacy to her deserving children, the vast tracts that shall have become by their toil and skill rich valleys and productive plains and fertile fields.

The expense to the State has, undoubtedly, been greater this first year than it will be in subsequent years, but no person who has the best interests of the State at heart will complain of reasonable expense along the line of this great and beneficent plan to better the condition of thousands of our citizens, while at the same time we add to the population of sparsely settled districts and benefit township, county and State by an equalization of the taxes based on the paying taxable property of the townships.

MISCELLANEOUS.

During the past year a little more than 5,000 acres of land in the counties of Gogebic, Houghton and Ontonagon have been selected, under the indemnity provisions of act of congress, March 2, 1855, and confirmatory act of 1857. After the selection and certification of the lands under indemnity certificate, the commissioner of the general land office refused to issue his certificate for approval to the secretary of the interior, on the ground that congressional act of 1889 had reserved all lands in Michigan for homestead purposes, and the State, therefore, was barred from the selection of lands to which it was entitled under the acts passed by congress in 1855 and 1857.

It was clearly my judgment that the commissioner was in error in so holding, and in company with Hon. James McMillan (to whom the State is indebted for his able and valuable service in this behalf) I appeared before the secretary of the interior to urge the injustice of the commissioner's ruling. That our views were correct and the arguments used effective is evidenced by the fact that patent for the land was issued, and the land will be offered at public sale at this office on August 13 at $8.00 per acre. The State, by this effort in its interest, will receive, if the lands are sold, some $40,000.00.

The following is a comparative statement of the number of acres of State land disposed of, and the amount received for the same for the past five years:

Years.	Primary school land. Acres.	University land. Acres.	Asylum land. Acres.	D. & M. R. R. land. Acres.	Salt spring land. Acres.
1892	7,898 92				120.
1893	10,409.58		80.		
1894	7,180.87		400.	83 75	
1895	4,395.98				
1896	7,877.07	40.			40.

Years.	Agricultural college land. Acres.	Asset land. Acres.	Swamp land. Acres.	Total. Acres.	Amount sold for.
1892		40.	12,230 87	20,169.69	$42,251 05
1893	14,981.99		6,992.43	32,464 00	166,718 40
1894	40.		6,671.39	14,376.01	38,626 22
1895	43.35		4,733.71	9,177.04	24,790 96
1896	1,938.21		5,092 88	14,988.16	53,208 42

For details of the transactions of this department reference is made to the tabular statements in the appendix submitted herewith.

WILLIAM A. FRENCH,
Commissioner.

APPENDIX

TABLE No. 1.—*Showing by counties the number of acres of agricultural college lands sold, the amounts for which the same was sold, the amounts paid and the amounts unpaid thereon, during the year ending June 30, 1896.*

Counties.	Original sales.					Forfeited lands resold.					Total sales.			
	Acres.	Price per acre.	Amount sold for.	Amount paid.	Amount unpaid.	Acres.	Price per acre.	Amount sold for.	Amount paid.	Amount unpaid.	Total acres.	Total amount sold for.	Total amount paid.	Total amount unpaid.
Antrim	40.	$7 50	$300 00	$75 00	$225 00	40.	$6 00	$240 00	$240 00		200.	$1,480 00	$550 00	$930 00
	80.	8 00	640 00	160 00	480 00	40.	7 50	300 00	75 00	$225 00				
Benzie	80.	9 00	720 00	720 00		40.	9 00	360 00	360 00		640.	6,395 00	6,395 00	
	400.	10 00	4,000 00	4,000 00		40.	10 00	400 00	400 00					
						40.	11 25	450 00	450 00					
						40.	11 63	465 00	465 00					
Charlevoix						40.11	5 00	200 55	200 55		40.11	200 55	200 55	
Kalkaska						80.	5 00	400 00	100 00	300 00	80.	400 00	100 00	300 00
Manistee	42.52	5 00	212 60	62 60	150 00						335.53	3,016 76	2,666 76	350 00
	45.61	6 00	273 66	273 66										
	.53	7 00	3 71	3 71										
	6.25	8 00	50 00	50 00										
	43.	9 00	387 00	387 00										
	81.50	10 00	815 00	815 00										
	38.65	11 00	425 15	425 15										
	37.47	12 00	449 64	449 64		40.	10 00	400 00	200 00	200 00				
Otsego	166.56	6 50	1,082 64	1,082 64							166.56	1,082 64	1,082 64	
Wexford	76.93	5 00	384 65	249 65	135 00						476.01	3,057 29	1,127 81	1,929 48
	200.	6 00	1,200 00	300 00	909 00									
	80.	7 00	560 00	350 00	210 00									
	79.08	8 00	632 64	158 16	474 48	40.	7 00	280 00	70 00	210 00				
Totals	1,498.10		$12,136 69	$9,562 21	$2,574 48	440.11		$3,495 55	$2,560 55	$935 00	1,938 21	$15,632 24	$12,122 76	$3,509 48

TABLE NO. 2.—*Showing by counties the number of acres of primary school land sold, the amounts for which the same was sold, the amounts paid and the amounts unpaid thereon during the year ending June 30, 1896.*

Counties.	Original sales.					Forfeited lands resold.					Total sales.			
	Acres.	Price per acre.	Amount sold for.	Amount paid.	Amount unpaid.	Acres.	Price per acre.	Amount sold for.	Amount paid.	Amount unpaid.	Total acres.	Total amount sold for.	Total amount paid.	Total amount unpaid.
Alcona	40.	$4 00	$160 00	$160 00		40.	$4 00	$160 00	$160 00		80.	$320 00	$320 00	
Alger	1,079.	4 00	4,316 00	4,316 00							1,079.	4,316 00	4,316 00	
Allegan	360.	1 25	450 00	450 00		40.	4 00	160 00	80 00	$80 00	400.	610 00	530 00	$80 00
Alpena	120.	4 00	480 00	400 00	$80 00						120.	480 00	400 00	80 00
Antrim	40.	4 00	160 00	80 00	80 00						40.	160 00	80 00	80 00
Baraga	280.	4 00	1,120 00	1,120 00							280.	1,120 00	1,120 00	
Charlevoix	40.	4 00	160 00	160 00							40.	160 00	160 00	
Cheboygan	113.96	4 00	455 84	357 92	97 92						113.96	455 84	357 92	97 92
Chippewa	560.	4 00	2,240 00	1,440 00	800 00						560.	2,240 00	1,440 00	800 00
Clare	80.	4 00	320 00	240 00	80 00						80.	320 00	240 00	80 00
Clinton						46.20	4 00	184 80	92 40	92 40	46.20	184 80	92 40	92 40
Crawford	40.	4 00	160 00	160 00							40.	160 00	160 00	
Delta	520.	4 00	2,080 00	1,760 00	320 00						520.	2,080 00	1,760 00	320 00
Dickinson	279.43	4 00	1,117 72	1,117 72							279.43	1,117 72	1,117 72	
Emmet						188.96	4 00	755 84	377 92	377 92	188.96	755 84	377 92	377 92
Gogebic	40.	4 00	160 00	80 00	80 00						40.	160 00	80 00	80 00
Grand Traverse	120.	4 00	480 00	400 00	80 00	40.	4 00	160 00	80 00	80 00	160.	640 00	480 00	160 00
Gratiot	40. 200.	1 25 4 00	50 00 800 00	50 00 400 00	400 00	80.	4 00	320 00	160 00	160 00	320.	1,170 00	610 00	560 00
Houghton	240.	4 00	960 00	960 00							240.	960 00	960 00	
Iron	40.	4 00	160 00	160 00							40.	160 00	160 00	
Leelanau						53.10	4 00	212 40	106 20	106 20	53.10	212 40	106 20	106 20
Luce	77.30	4 00	309 20	309 20							77.30	309 20	309 20	
Mackinac	120.	4 00	480 00	240 00	240 00						120.	480 00	240 00	240 00
Marquette	40. 560.	30 00 4 00	1,200 00 2,240 00	1,200 00 2,240 00							600.	3,440 00	3,440 00	
Mecosta						80.	4 00	320 00	160 00	160 00	80.	320 00	160 00	160 00
Menominee	480.	4 00	1,920 00	1,920 00							480.	1,920 00	1,920 00	
Midland	40.	4 00	160 00	80 00	80 00						40.	160 00	80 00	80 00
Montmorency	42.	4 00	168 00	88 00	80 00						42.	168 00	88 00	80 00
Muskegon	160.	1 25	200 00	200 00							160.	200 00	200 00	
Oceana	40.	4 00	160 00	80 00	80 00	40.	4 00	160 00	80 00	80 00	80.	320 00	160 00	160 00
Ontonagon	240.	4 00	960 00	960 00							240.	960 00	960 00	
Otsego	160.	4 00	640 00	320 00	320 00						160.	640 00	320 00	320 00

Ottawa						40.	4 00	160 00	109 63	50 37	40.	160 00	109 63	50 37
Presque Isle	361.62	4 00	1,446 48	966 48	480 00						361.62	1,446 48	966 48	480 00
Saginaw	355.50	4 00	1,422 00	1,027 00	395 00	40.	4 00	160 00	160 00		395.50	1,582 00	1,187 00	395 00
Sanilac	80.	4 00	320 00	240 00	80 00						80.	320 00	240 00	80 00
Schoolcraft	120.	4 00	480 00	480 00							120.	480 00	480 00	
Tuscola						40.	4 00	160 00	160 00		40.	160 00	160 00	
Van Buren						40.	4 00	160 00	80 00	80 00	40.	160 00	80 00	80 00
Totals	7,108 81		$27,935 24	$24,162 32	$3,772 92	768.26		$3,078 04	$1,806 15	$1,266 89	7,877.07	$31,008 28	$25,968 47	$5,039 81

TABLE No. 3.—*Showing by counties the number of acres of salt spring land sold, the amount for which the same was sold, the amount paid and the amount unpaid thereon during the year ending June 30, 1896.*

Counties.	Original sales.					Forfeited land resold.					Total sales.			
	Acres.	Price per acre.	Amount sold for.	Amount paid.	Amount unpaid.	Acres.	Price per acre.	Amount sold for.	Amount paid.	Amount unpaid.	Total acres.	Total amount sold for.	Total amount paid.	Total amount unpaid.
Midland	40.	$4 00	$160 00	$80 00	$80 00						40.	$160 00	$80 00	$80 00

TABLE No. 4—*Showing by counties the number of acres of university land sold, the amount for which the same was sold, the amount paid and the amount unpaid thereon during the year ending June 30, 1896.*

Counties.	Original sales.					Forfeited land resold.					Total sales.			
	Acres.	Price per acre.	Amount sold for.	Amount paid.	Amount unpaid.	Acres.	Price per acre.	Amount sold for.	Amount paid.	Amount unpaid.	Total acres.	Total amount sold for.	Total amount paid.	Total amount unpaid.
Kalamazoo	40.	$12 00	$480 00	$240 00	$240 00						40.	$480 00	$240 00	$240 00

TABLE No. 5.—*Showing by counties the number of acres of swamp land licensed to settlers during the year ending June 30, 1896.*

Counties.	Acres.	Counties.	Acres.
Alpena	1,826.97	Iosco	280.
Bay	200.	Menominee	80.
Charlevoix	120.	Missaukee	160.
Cheboygan	2,097.16	Montmorency	80.
Clare	80.	Ogemaw	119.80
Delta	88.17	Ottawa	40.
Emmet	240.	Presque Isle	320.
Gladwin	215.09	Roscommon	280.
Total			6,207.19

TABLE No. 6.—*Showing by counties the number of acres of swamp land standing licensed to settlers on June 30, 1896.*

Counties.	Acres.	Counties.	Acres.
Alpena	4,961.35	Kalkaska	197.11
Antrim	141.89	Leelanau	160.
Arenac	240.	Livingston	80.
Bay	200.	Mackinac	80.
Charlevoix	483.10	Mecosta	40.
Cheboygan	6,567.44	Menominee	197.53
Clare	151.48	Missaukee	120.
Crawford	40.	Montmorency	80.
Delta	855.97	Ogemaw	450.76
Emmet	240.	Oscoda	40.
Genesee	40.	Ottawa	40.
Gladwin	870.81	Presque Isle	1,254.55
Grand Traverse	80.51	Roscommon	280.
Huron	40.	Sanilac	120.
Iosco	1,229.50	Wexford	40.
Total			19,322.

TABLE No. 7.—*Showing by counties the number of acres of State tax homestead lands licensed to settlers during the year ending June 30, 1896.*

Counties.	Acres.	Counties.	Acres.
Bay	5,124.62	Missaukee	1,086.84
Crawford	560.	Montcalm	3,950.13
Huron	464.70	Montmorency	1,240.
Isabella	4,120.87	Presque Isle	680.23
Kalkaska	1,173.13		
		Roscommon	132.75
Kent	476.10	Saginaw	40.
Lapeer	160.	Sanilac	360.
Mecosta	17,346.19	Tuscola	1,025.
Midland	2,184.93		
Total			40,125.49

TABLE No. 9.—*Showing by counties the number of acres of all classes of lands, that forfeited to the State for non-payment of interest during the year ending June 30, 1896.*

Counties.	Agricultural College land.	Primary School land.	Total.
	Acres.	Acres.	Acres.
Arenac		80.	80.
Cheboygan	80.	69.90	149.90
Emmet		236.01	236.01
Iosco		36.86	36.86
Kalkaska	40.		40.
Mason		40.	40.
Presque Isle		40.	40.
Schoolcraft		40.	40.
Tuscola		40.	40.
Wexford	40		40.
Totals	160.	582.77	742.77

TABLE No. 10.—*Showing the number of acres of all classes of land disposed of, the amounts for which the same were sold, the amounts paid and the amounts unpaid thereon during the year ending June 30, 1896.*

Class of land.	Acres.	Amount sold for.	Amount paid.	Amount unpaid.
Agricultural college	1,938.21	$15,632 24	$12,122 76	$3 509 48
Primary school	7,877.07	31,008 28	25,968 47	5,039 81
Patented homesteads	797.45			
Salt spring	40.	160 00	80 00	80 00
Swamp	4,295 43	5,927 90	5,128 84	799 06
University	40.	480 00	240 00	240 00
Totals	14,988 16	$53,208 42	$43,540 07	$9,668 35

Table No. 11.—*Showing amount of matured swamp land credit June 30, 1896.*

	Amount.	Amount.
Lower peninsula—General credit:		
Alpena, Montmorency and Presque Isle counties	$0 33	
Alpena and Presque Isle counties	36	
Bay and Tuscola counties	13 33	
Gratiot county	74 69	
Midland county	14 63	
Newaygo, Mecosta and Osceola counties	10 51	
Newaygo and Muskegon counties	81 35	
Tuscola county	193 56	
		$388 76
Lower Peninsula		2,455 46
Total in lower peninsula		$2,844 22
Upper peninsula—General credit:		
Delta county, range 18	$0 28	
Upper peninsula	1,598 02	1,598 30
Total general credit		$4,442 52

Special credit.	Acres.	Acres.
Under grant to Livingston county, act No. 130, laws of 1883, lower peninsula lands	3,398.48	
Under grant to Ingham county, act No. 231, laws of 1885, lower peninsula lands	1,480.	
Under grant to Shiawassee and Clinton counties, act No. 84, laws of 1885, lower peninsula lands	2,607.87	7,486.35
Under grant to Houghton and Keweenaw counties, act No. 239, laws of 1863, upper peninsula lands		2,165.27
Total special credit		9,651.62

TABLE No. 12.—*Showing by counties the number of acres of land, of all classes, remaining unsold June 30, 1896.*

Counties.	Swamp land @ $1.25.	Swamp land @ $2.00.	Primary school land.	Agricultural College land.	University land.	Salt Spring land.	Asylum land.	Tax homestead land.	Total acres.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
Alcona	4,339.39		2,803.64	18,525.71				18,503.04	44,171.78
Alger			14,767.28						14,767.28
Allegan			584.41					3,054.74	3,639.15
Alpena	12,900.42		3,560.	1,000.				11,319.49	28,779.91
Antrim	40.	13.45	280.	2,320.93					2,654.38
Arenac	120.		915.99						1,035.99
Baraga		a 294.60	7,305.98						7,600.58
Barry			119.87						119.87
Bay	118.19		40.					2,350.40	2,508.59
Benzie	360.		160.	2,720.					3,240.
Calhoun	38.84								38.84
Charlevoix	807.05		1,655.45	2,119.43					4,581.93
Cheboygan	3,707.28	2,584.74	6,185.83	5,159.81					17,637.66
Chippewa		240.	17,955.18						18,195.18
Clare	546,36		1,822.26						2,368.62
Crawford	7,350.01		2,835.70					12,356.57	22,542.28
Delta	23,321.09		7,511.30						30,832.39
Dickinson			3,240.						3,240.
Emmet	3,362.99	400.	1,487.05					4,678.08	9,928.12
Gladwin	178.10		854.78						1,032.88
Gogebic	120.		8,487.67						8,607.67
Grand Traverse	480.		520.	160.					1,160.
Gratiot	40.								40.
Houghton			5,760.						5,760.
Huron			70.65					515.77	586.42
Ingham			40.						40.
Iosco	2,747.47		3,626.26	26,322.27					32,696.
Iron			3,945.05						3,945.05
Isabella			120.					296.81	416.81
Isle Royal	3,787.13		b 3,337.75						7,124.88
Jackson			400.						400.
Kalamazoo					40.				40.
Kalkaska	250.80		1,720.14	1,118.				8,625.98	11,714.92
Kent			80.					80.	160.
Keweenaw		c 40.	d 626.75						666.75
Lake	40.		3,230.844						3,270.844
Leelanau	457.25	38.23	1,000.95						1,496.43

Luce			14,603.60						14,603.60
Mackinac		1,534.34	13,337.53					74.50	14,946.87
Manistee	40.		e 661.82	5,018.855					5,719.675
Marquette			f 15,235.46						15,235.46
Mason			640.						640.
Mecosta								1,116.01	1,116.01
Menominee	4,017.41	120.	2,676.20						6,813.61
Midland			507.56			400.		1,619.44	2,527.
Missaukee	1,552.76	871.28	1,044.	879.64				15,909.81	20,257.49
Montcalm								63.60	63.60
Montmorency	3,229.45		3,907.20	6,649.50				33,085.05	46,871.20
Muskegon			280.				440.		720.
Newaygo	40.		g 881.92				722.98		1,644.90
Oceana			480.						480.
Ogemaw	844.26		1,762.69						2,606.95
Ontonagon			h 11,184.824						11,184.824
Osceola	40.		543.87						583.87
Oscoda	636.87		4,160.	13,370.22					18,167.09
Otsego	4,564.56		1,400.20	996.58					6,961.34
Ottawa			428.17						428.17
Presque Isle	11,697.99	1,843.02	4,778.42	400.				10,760.66	29,480.09
Roscommon	7,767.77		2,287.82					47,164.46	57,220.05
Saginaw			84.50						84.50
Sanilac			390.07						390.07
Schoolcraft			11,039.01						11,039.01
Tuscola			320.					123.20	443.20
Wexford	40.		1,036.96	13,112.01					14,188.97
Totals	99,583.44	7,979.66	200,721.608	99,872.455	40.	400.	1,162.98	171,697.61	581,457.753

a Includes 40 acres @ $6.00 per acre.
b Includes 2,564.75 acres of restored mineral lands @ $10.00 per acre.
c Includes 40 acres restored mineral land @ $3.00 per acre.
d Includes 40 acres restored mineral land @ $7.00 per acre.
e Includes 40 acres @ $1.25 per acre to be sold for cash only.
f Includes 1,347.19 acres of restored mineral lands @ $6.00 to $30.00 per acre.
g Includes 120 acres @ $1.25 per acre to be sold for cash only.
h Includes 40 acres restored mineral lands @ $7.00 per acre.

REPORT

OF THE

QUARTERMASTER GENERAL

OF THE

STATE OF MICHIGAN

FROM

JULY 1, 1894, TO JUNE 30, 1896

BY AUTHORITY

LANSING
ROBERT SMITH PRINTING CO., STATE PRINTERS AND BINDERS
1896

REPORT.

HON. JOHN T. RICH, *Governor and Commander-in-Chief:*

SIR—In obedience to the provisions of the general law requiring a biennial report of the doings of this department I have the honor to submit the following:

The death of the late Quartermaster General George M. Devlin was profoundly regretted by every citizen of Michigan who had the interest of our National Guard at heart, and by no one more than yourself, of whose administration he was a distinguished ornament. He had been connected with the department for many years, and the single hearted earnestness and the trained ability with which he discharged its duties had brought it up to a high standard of efficiency. It was justly regarded as a misfortune when his work was interrupted by death.

You know with how much hesitancy I consented to take upon myself the responsibilities of this office. Though I had been for ten or eleven years identified in one capacity or another with the National Guard of the State, my experience in the quartermaster's department was limited to a single year as Assistant Quartermaster General on the staff of Brigadier General William H. Withington.

I was commissioned July 1, 1895, and found the plans for the annual encampment of that year so far advanced and so complete in all respects little was left for me to do, except to carry on the work so well begun by my predecessor, and finish it, as near as might be, as he would have done had he lived. In this I was most ably and efficiently assisted by Lieutenant Colonel S. H. Avery and Captain Harry C. Devlin, Assistants Quartermaster General. That camp was a very successful one and in many respects the most satisfactory one that had been held up to that time. Some complaint was made as to the quality of water furnished, and steps were taken to remedy that defect before another one. The hospital arrangements were good and there was very little sickness. More pains were taken in laying out the camp, the streets were widened and tents and buildings set up with more regularity.

I very soon learned that the brigade was not equipped as it ought to be in order to be prepared for field service on short notice. The military fund is barely sufficient to defray the cost of the annual encampment and the ordinary expenses of replacing worn out and condemned clothing, etc. In the fall of 1894 and 1895 the riots at Ironwood and

Ishpeming in the Northern Peninsula occasioned a direct, extraordinary expenditure of $492. 70, from the military fund, besides an indirect expenditure of $1,433.70 for replacing clothing, camp and garrison equipage, etc., worn out and destroyed by winds and storms. For details of duty I invite your attention to "Exhibit A" in the appendix of this report.

Early in the present year I became so strongly impressed with the importance of improving the field equipment of the brigade that I submitted for your consideration a schedule of requirements for placing it upon a footing for instantaneous field duty. That schedule was substantially as follows, giving items for 2,500 men, with estimated cost:

2,500	Blouses	$10,000 00
2,500	Belts	3,150 00
2,500	Caps	2,500 00
2,500	Blanket bags and attachments	6,000 00
2,500	Shelter tents and poles	3,500 00
45	Ovens	2,250 00
2,500	Meat ration cans, knives, forks, cups, spoons and plates	2,500 00
1,000	Overcoats	8,780 00
2,500	Rubber blankets	2,750 00
	Total	$41,430 00

While there was an apparent necessity that these things should be supplied, it was obvious that it could not be done except at the cost of omitting one encampment. This, in the judgment of the Military Board, it was not expedient to do, though my personal opinion is that the wisdom of such a course would become manifest.

This deficiency in overcoats and blouses has been partially made up since that time by requisition on the United States, but I most earnestly submit that the following ordnance and quartermaster's stores should be supplied at the earliest possible moment:

1,000 Springfield rifles, cal. 45.
2,500 Service cartridge belts.
3,000 Shelter tents and poles.
3,000 Meat ration cans, knives, forks, tin plates and tin cups.
3,000 Rubber blankets.
800 Haversacks and canteens.
46 Field ranges.

I deem it proper to say that experience does not seem to justify the recommendation of my predecessor in favor of the Krag-Jorgensen rifle. The Springfield rifle is not yet superseded and its use should be continued until further tests have demonstrated the reliability and advisability of a change.

The arms, accoutrements and clothing now in use are in good serviceable condition, natural wear and tear considered. The thorough system of inspection at the company stations inaugurated by the Inspector General has been productive of much good in requiring better attention to the care of quartermaster's and ordnance stores in the custody of company officers. The unserviceable has been weeded out and turned in and it is my belief that the condition in this regard is very much improved.

In resuming my relations with the military establishment of the State after a respite of eight years I find attached to it a new feature, that of the Michigan State Naval Brigade. My tenure of this office has been so brief and my observation of the actual workings of these divisions has been so slight that I do not feel myself competent to discuss the subject. So far as I have been able to judge, however, it is a valuable auxiliary to the military forces of the State. It takes the place of artillery for all practical purposes, and could be depended upon for efficient service in an emergency.

I have the honor to submit a review of the transactions of this Department from July 1, 1894, to July 30, 1896, together with inventories of ordnance, ordnance stores, camp equipage, clothing, quartermaster's stores and naval stores in the possession of bonded officers of the National Guard and Naval Brigade.

RECEIPTS AND DISBURSEMENTS.

There was remaining on hand July 1, 1894, two thousand three hundred forty-seven dollars and twenty-five cents ($2,347.25), and there has been received from the State Treasurer one hundred ninety-two thousand four hundred twenty-one dollars and twenty cents ($192,421.20), and from miscellaneous sources one hundred twenty-nine dollars and eighty-five cents ($129.85). Making a total amount of money to be accounted for one hundred and ninety-four thousand eight hundred ninety-eight dollars and thirty cents ($194-898.30).

Cash on hand July 1, 1894	$2,347	25
Received from State Treasurer	192,421	20
Received from interest on military fund deposited in bank	83	35
Received from condemned stores sold	46	50
	$194,898	30

The following classifications gives the expenditures from July 1, 1894, to July 1, 1896, as per original vouchers filed with the Auditor General and certified by the State Military Board, also duplicate vouchers filed in this office.

Ordnance, clothing, equipage, quartermaster stores and repairs on same	$3,941	08
Expense of Adjutant General's office, including clerk hire and traveling expenses	3,625	05
Expense of Quartermaster General's office, including clerk hire and traveling expenses	3,802	17
Expense of Inspector General's office, including clerk hire and traveling expenses	1,784	93
Traveling expenses of State Military Board and per diem	494	39
Expenses in armory, including salary of Armorer	1,551	00
Rent of 40 armories	23,867	32
Postage stamps, postal cards and P. O. drawer rent for military departments	463	00
Printing, books, lithographing and stationery for use of military headquarters, including brigade, regiments and companies	1,455	11
Incidental expenses at brigade headquarters allowed by the rules and regulations, including salary of the Assistant Adjutant General	400	00
Incidental expenses at headquarters 1st, 2d, 3d, 4th, and 5th regiments of infantry	925	35

Incidental expenses at headquarters of forty companies	$7,949 38
Pay of forty captains for care of arms, clothing, etc.	3,425 93
Pay of five adjutants	501 00
Pay of five regimental quartermasters	520 83
Expense of encampment of 1894, including per diem, subsistence, transportation, removal of buildings, construction of guard houses, store houses, stables, kitchens, etc.	48,946 26
Expense of encampment of 1895, including per diem, subsistence, transportation of troops, freight, teams, labor, fuel, forage, etc.	47,424 11
Regimental elections	289 87
Freight, express, telephone, telegraph and other miscellaneous expenses	2,917 04
Transportation of officers traveling on military business	340 60
Cash on hand July 1, 1896	40,273 88
Total	$194,898 30

Clothing, Camp and Garrison Equipage, Miscellaneous Supplies, Repairing and Cleaning.

Crossed rifles, letters and figures	$352 00
Repairing tents	390 03
Wall tents	176 96
Tent poles and pins	81 50
U. S. silk colors and State flags	872 50
Bed sacks and repairs on same	331 69
Garden hose	51 50
Tin cups, wash basins, torches, pails, etc.	181 90
Tools	7 00
Bedsteads	33 00
Bed springs	46 50
Mattresses	31 50
Pillows, sheets, pillow cases and towels	83 55
Mirrors	12 00
Camp tables	36 91
Camp chairs	218 86
Iron mauls	22 50
Matting	42 80
Targets, disks, etc.	54 72
Books S and I	90 00
Lumber	165 00
Kitchen slop buckets	32 00
Clothing, cleaning, and repairing same	310 00
Total	$3,625 05

Expenses, Adjutant General's Office.

Salary of Assistant Adjutant General	$3,600 00
Incidental expenses	25 05
Total	$3,625 05

Expenses, Quartermaster General's Office.

Salary of Assistant Quartermaster General	$3,600 00
Incidental expenses	202 17
Total	$3,802 17

Expenses Inspector General's Office.

Salary of Inspector General's clerk from January 1, 1895	$500 00
Traveling expenses of Inspector General's department	1,284 93
Total	$1,784 93

Expenses of State Military Board.

Per diem and expenses	$494 89

Expenses in Armory.

Salary of Armorer	$1,440 00
Extra labor, shipping camp equipage, Q. M. and ordnance stores	111 00
Total	$1,551 00

Rent of Armories.

Rent of forty armories for use of companies	$23,867 42

Postage Stamps, Postal Cards, Post Office Drawer Rent and Postage Due on Letters Received.

Adjutant General's office	$192 00
Quartermaster General's office	210 00
Inspector General's office	53 00
Post office drawer rent	8 00
Total	$463 00

Books, Stationery, Blanks, Printing and Office Supplies for Adjutant General, Inspector General, Quartermaster General, Brigadier General commanding First Brigade, Headquarters First, Second, Third, Fourth, and Fifth Regiments of Infantry, and Headquarters of Forty Companies.

Letter heads and envelopes	$891 25
Account and record books	121 30
Blanks	443 06
Total	$1,455 61

Expenses at Headquarters First Brigade, including pay of Assistant Adjutant General.

Salary of Assistant Adjutant General	$200 00
Incidental expenses	200 00
Total	$400 00

Incidental Expenses at Regimental Headquarters.

Headquarters first infantry	$190 40
" second "	200 00
" third "	198 70
" fourth "	186 25
" fifth "	150 00
Total	$925 35

Incidental Expenses at Headquarters of Forty Companies, as Allowed by Rules and Regulations.

Forty companies	$7,949 38

Pay of Captains for care, safe keeping, and accountability for arms, clothing, etc., as per rules and regulations	$3,425 93

Pay of Adjutants for accountability for Ordnance and Quartermaster's stores and keeping records at regimental headquarters	$501 00

Pay of Regimental Quartermasters for care and accountability for Ordnance, Quartermaster's stores, clothing and equipage	$520 83

Expense of Encampment of 1894.

Pay and subsistence	$34,910 66
Transportation of troops, cooks, waiters, hostlers, laborers, lumber, ice, camp equipage and Quartermaster's stores	8,246 24
Use and transportation of horses	1,735 10
Labor of men and teams, moving buildings, constructing buildings, establishing and breaking camp	2,230 95
Medical supplies and groceries for hospital	249 09
Ice	177 00
Printing	44 59
Lumber	165 01
Hardware, nails, putty, glass, paints and oils	359 62
Fuel	212 42
Forage and straw	321 32
Telegrams, express, soap, candles and kerosene oil	188 83
Damages to crops, fences and R. R. cars	105 43
Total	$48,946 26

Expense of Encampment of 1895.

Pay and subsistence	$32,941 03
Transportation of troops, cooks, waiters, hostlers, laborers, lumber, ice, ordnance and Quartermaster's stores, and camp equipage	7,004 65
Use and transportation of horses, including pay of hostlers	2,263 60
Medical supplies and groceries for hospital	299 70
Ice	237 75
Printing	104 75
Lumber	420 29
Fuel	195 44
Forage and straw	410 11
Hardware, nails, glass, putty, paints and oils	413 90
Telegrams, express, soap, candles and kerosene oil	207 32
Labor of men and teams, constructing buildings, establishing and breaking camp	2,600 75
Medical services attending Private Lent	25 00
Rent of ground and preparing rifle range	299 91
Total	$47,424 11

Transportation of officers and enlisted men traveling under orders other than encampments and riots	$340 60

Expense of Regimental Elections.

Second infantry	$112 70
Third "	150 77
Fourth "	26 40
Total	$289 87

Miscellaneous Expenses.

Traveling expenses of officers other than department officers under orders	$27 68
Telegrams	84 50
Rent of telephones and messages	74 90
Care of war museum	240 00
Funeral expenses of Generals Eaton and Devlin	224 10
Medical attendance and medicine, enlisted men under treatment after camp 1895	129 15
Lumber, nails, etc., for permanent improvement at camp ground	624 84
Cooking utensils, table ware and funeral expenses of Private Himes killed at Ishpeming	492 70
Army and navy journal and register	12 00
Express on Q. M. stores, books, blanks, etc.	184 52
Cartage on Ordnance, Q. M. stores and camp equipage	61 60
Salary of stenographer and typewriter	180 00
Smith Premier Typewriter	65 00
Freight on Ordnance, Q. M. stores and camp equipage	616 05
Total	$2,917 14

Inventory of Ordnance, Ordnance stores, Quartermasters stores, clothing, camp and garrison equipage in the possession of the Quartermaster General and bonded officers on June 30, 1896.

Kind of stores.	In possession of the Quartermaster General.	In possession of bonded officers.
Gatling gun, cal. 1 inch	1	
“ “ carriage	1	
“ “ chest	1	
“ “ limber	1	
Parrott “ cal. 3 inch	2	1
“ “ carriage	2	1
“ “ limbers	3	1
“ “ chests	3	1
Brass 4 pounder		1
“ “ limber		1
“ “ chest		1
“ howitzer (unmounted)	1	
Rammer and sponges	7	
Gunners haversacks	3	
Sets double harness	6	
Halters	8	
Bridles	25	42
Saddles	24	41
Saddle housings, general officers	5	1
Saddle cloths, officers of infantry	5	37
“ “ staff officers	15	4
Thumb stalls	2	
Springfield rifles, cal. 45	66	2,102
“ “ bayonets	142	2,094
Bayonet scabbards	121	2,429
Cartridge boxes	142	2,485
Waist belts	54	2,548
Waist belt plates	72	2,610
Knapsacks	195	1,829
Canteens	50	1,843
Canteen straps	50	1,838
Haversacks	56	1,883
Haversack straps	52	1,880
Breech block cap screws	25	17
Spring or thumb vises	5	38
Tumbler punches	140	112
Tumblers	25	40

Inventory.—Continued.

Kind of stores.	In possession of the Quartermaster General.	In possession of bonded officers.
Headless shell extractors	180	378
Bridles	80	32
Bridle screws	10	33
Cam latch springs	100	47
Extractors	153	45
Ejector springs and spindles	41	83
Combination screw drivers	6	260
Firing pins	300	222
Firing pin screws	85	52
Spurs, pairs	9	20
Main springs	10	37
Sears	10	37
Sear screws	23	14
Sear springs		28
Tumbler or hammer screws	37	81
Hammers	11	
Side screws	10	
Side screw washers	5	
Front sight covers	50	
Wiping rods	80	422
Arm chests		40
Upper bands	60	
Breech blocks	54	
Triggers	23	
Trigger screws	40	
Tang screws	65	
Guard bows	7	
Guard bow plates	7	
Side plates	8	
Gun slings	163	2,149
Officers' swords	19	124
" sword scabbards	19	122
" sabers	1	51
" saber scabbards	1	51
Chamois sword and saber cases	11	75
Non-commissioned officers' swords	1	12
" " " sword scabbards	1	12
Revolvers (S. & W.)	2	
Ball cartridges, Gatling gun	1,000	
Canister cartridges, Gatling gun	1,000	
Friction primers	350	
Ball cartridges, 45 cal	50,000	57,640
Blank cartridges, 45 cal	22,000	6,395
Helmets, complete	1,599	67
Helmets, complete (unserviceable)	1,485	
Campaign hats		2,643
Campaign hats (unserviceable)	102	
Forage caps	380	2,904
Forage caps (unserviceable)	500	
Overcoats	5	1,702
Overcoats (unserviceable)	180	
Uniform coats	729	14
Uniform coats (unserviceable)	1,916	
Uniform coats, musician	28	69
Uniform coats, musician (unserviceable)	187	
Blouses	101	3,045
Blouses (unserviceable)	399	
Trousers	233	3,118
Trousers (unserviceable)	463	
Blankets	249	2,691
Blankets (unserviceable)	265	
Figures for helmets (unserviceable)	2,666	
Crossed rifles, letters and figures	610	2,734
Crossed rifles, letters and figures (unserviceable)	680	
Leggings, pairs	169	2,608
Leggings, pairs (unserviceable)	285	
Chevrons, Sergt. Major, gold lace, pairs (unserviceable)	4	
" " " cloth, " "	2	
" " " " " (serviceable)		5
" Quartermaster Sergt., gold lace, pairs (unserviceable)	4	
" " " cloth, " (serviceable)		10
" Color Sergt., gold lace, pairs (unserviceable)	9	
" " " cloth, pairs (serviceable)		5
" " " " " (unserviceable)	4	

Inventory.—Continued.

Kind of stores.	In possession of the Quartermaster General.	In possession of bonded officers.
Chevrons, Hospital Steward, gold lace, pairs (unserviceable)	8	
" " " cloth, pairs (unserviceable)	6	
" " " " " (serviceable)		4
" Principal Musicians, gold lace, pairs (unserviceable)	6	
" " " cloth, pairs (unserviceable)	5	
" " " " " (serviceable)		4
" Ordnance Sergt., cloth, pairs (unserviceable)	2	
" 1st Sergt., gold lace, pairs (unserviceable)	54	
" " " cloth, pairs (unserviceable)	7	
" " " " " (serviceable)		47
" Sergt., gold lace, pairs (unserviceable)	267	
" " " " " (serviceable)		6
" " cloth, pairs (serviceable)		205
" " " " (unserviceable)	83	
" Corp., gold lace, pairs (unserviceable)	289	
" " " " " (serviceable)		11
" " cloth, pairs (serviceable)		387
" " " " (unserviceable)	62	
" Peace and war, (serviceable)		321
" " " " (unserviceable)	308	
Trousers stripes, Sergt., pairs	80	292
" " Corp., "	48	400
" " musicians, pairs		182
Flags, U. S., silk	1	5
" State,	1	5
" garrison	1	
" camp	2	
" hospital	1	
" brigade pennant	1	
" Q. M. Dept.	1	
" guidons	4	5
" halyards	7	
" slings		10
Rosters, commissioned officers	4	
Duty books	5	49
Enlistment records	2	50
U. S. drill regulations	3	192
Laws, rules and regulations	95	169
Blunt's small arms firing regulations	1	24
Order books	55	5
Manuals of guard duty	198	479
Information and security	8	76
Bed sacks	1,372	
Mattresses, bed	6	
" cot	72	
Wall tents, 7x7 (unserviceable)	26	
" " 9x9 (serviceable)	400	
" " 9x9 (unserviceable)	148	
" " 9x12 "	117	
" " 11x14 (serviceable)	5	
" " 11x14 (unserviceable)	1	
" " 12x18 (serviceable)	8	
" " 16x32 "	40	
" " 16x32 (unserviceable)	6	
" " Hospital (serviceable)	2	
" " " flies (serviceable)	2	
" " flies 9x9 (serviceable)	71	
" " " 9x12 "	61	
" " " 11x14 "	6	
" " " 12x18 "	8	
Wagon paulins (serviceable)	2	
Ambulance paulins (serviceable)	2	
Ambulances, complete (serviceable)	2	
Camp chairs (serviceable)	383	
" tables "	85	
Pails	57	
Tin cups	219	
Tin wash basins	128	
Spades and shovels	6	
Pick axes	1	
Rakes, iron	90	
Axes	19	
Brooms	89	
Lanterns	40	

Inventory.—Concluded.

Kind of stores.	In possession of the Quartermaster General.	In possession of bonded officers.
Iron mauls	67	....
Braces, hand	1	....
Brace bits	4	....
Brace screw drivers	1	....
Cold chisels	1	....
Hammers	1	....
Plyers	1	....
Saws, hand	4	....
Squares, steel	2	....
Bench vises	2	....
Oil cans, bench	1	....
" " 1 gal.	6	....
" " 3 gal.	6	....
Torches, gasoline	32	....
Wagon sprinkler	1	....
Water troughs	2	....
Stone boats	2	....
Stables	1	....
Guard houses	5	....
Market buildings	1	....
Store houses	15	....
Kitchens	50	....
Sinks	82	....
Flag staffs	2	....
Garden hose, feet	550	....
Hose bibbs	22	....
Hose nozzles	10	....
Cot beds	46	....
Litters	11	....
Surgical instruments	27	....
Tent floors	710	....
Mess tables	130	....
Water barrels	50	....
Slop buckets	40	....
Bed steads	24	....
Bed bottoms, woven wire	18	....
Wooden bunks	66	....
Iron stove	1	....
Scoring disks	22	....
Gasoline stoves	2	....
Baskets	16	....
Tin slop pails	12	....
Cuspidors	6	....
Candle sticks	100	....
Lamps	90	....
Bed pans	2	....
Matting, yards	57	....

Receipts and Disbursements on Account of the Michigan Naval Brigade, from January 1, 1895 to June 30, 1896.

Date.	From whom received.	For what disbursed.	Receipts.	Disbursements.
1895				
Sept. 28	State Treasurer		$2,802 05	
Dec. 8		Pay roll 1st Battalion hdqrs		$127 81
"		" " 1st Division		452 52
"		" " 2d "		339 89
"		" " 3d "		523 52
"		Mich. Central R. R. Co. transportation		157 95
"		Island Transportation Co. transportation		34 50
1896				
March 23		Freight on boats, 2d Division		133 00
"		Lithograph commissions		11 50
"		Printing blanks		17 24
"		" books and blanks		80 80
April 13		Freight on boats and equipments, 1st and 3d Division		148 23
		Balance on hand		775 09
			$2,802 05	$2,802 05

The following naval stores have been received from the U. S. Navy Department as a loan to the State of Michigan, for the use and benefit of the Naval Militia. The exact dates of receiving a large portion of these stores cannot be given, because of the stores being shipped direct to commanders of Divisions and the shipping bills and vouchers receipted and returned to Navy Department direct.

	3″ B. L. H. with field carriage and equipment.	Gatling gun with field carriage and equipment, 50 cal.	Remington rifles, cal. 50.	Sabre bayonets.	Bayonet scabbards.	Dummy cartridge, 3″.	Dummy projectile.	Passing boxes.	Cutlasses.	Cutlass Scabbards.	Cutlass frogs.	Cutlass belts.
From July 1, 1894 to June 30, 1896.	2	1	70	70	70	1	1	10	90	90	90	90

Naval Stores Loaned by U. S.—Continued.

From January 1, 1894 to June 30, 1896.	Cutter 28' 2''.	Cutter 28' 9''.	Cutter 28'.	Boat chests.	Breaker, 5 gal.	Breaker, 8 gal.	Breaker stands.	Buckets.	Foot boards and gratings.	Bottom boards (pieces).	Stretchers.	Awning stanchions.
	2	1	2	5	5	1	5	5	6	14	19	8

Naval Stores Loaned by U. S.—Continued.

From January 1, 1894 to June 30, 1896.	Stanchions.	Flag staffs.	Back Boards.	Rudders.	Tillers.	Oars.	Boat hooks.	Row locks.	Sets of spars.	Masts.	Booms.	Topmasts.
	6	5	3	3	4	66	14	12	1	8	4	6

Naval Stores Loaned by U. S.—Continued.

From January 1, 1894 to June 30, 1896.	Shrouds.	Gunter halyards.	Fore sheets.	Main sheets.	Jib sheets.	Foresail.	Mainsail.	Jib.	Boat covers.	Tarpaulins.	Boat fenders.	Trailing lines.
	12	6	3	3	3	3	3	3	3	3	18	36

Naval Stores Loaned by U. S.—Continued.

From January 1, 1894 to June 30, 1896.	Awnings.	Awning bags.	Cushions, sets.	Cushion bags.	Cushion covers.	Boat painters.	Jib halyards.	Anchors.	Cutter chains.	Boat grapnels.	Boat brails.
	2	2	4	3	2	4	2	2	2		4

Naval Stores Loaned to the Michigan State Naval Brigade from Stores Loaned from the U. S. Navy Department.

To whom loaned.	B. L. H. 8″ carriage and equipments.	Gatling gun with carriage and equipment, 50 cal.	Remington rifles, cal. 50.	Sabre bayonets.	Bayonet scabbards.	Dummy cartridge, 8″.	Dummy projectile.	Passing boxes.	Cutlasses.	Cutlass scabbards.	Cutlass frogs.	Cutlass belts.	Cutters, 28′ 2″.	Cutters, 28′ 9″.
1st Div. M. S. N. B.	1	1	......	......	.....	1	1	10	40	40	.....	......	1	1
2d " " " " "	1	......	70	70	70	......	......	......	50	50	50	50	1	..

Naval Stores Loaned to M. S. N. B.—Continued.

To whom loaned	Cutters 28′.	Boat chests.	Breakers, 5 gal.	Breakers, 8 gal.	Breaker stands.	Buckets.	Foot boards and gratings.	Bottom boards (pieces.)	Stretchers.	Awning stanchions.	Stanchions.	Flag staffs.	Back boards.	Rudders.
1st Div M. S. N. B.	1	3	5	1	3	3	6	14	10	6	6	5	3	3
2d " " " " "	1	2	....	......	2	2	......	.....	......	......	......	......	......	....

Naval Stores Loaned to M. S. N. B.—Continued.

To whom loaned.	Tillers.	Oars.	Boat hooks.	Row locks.	Sets of spars.	Masts.	Booms.	Topmasts.	Shrouds.	Gunter halyards.	Fore sheets.	Main sheets.	Jib sheets.	Foresail.	Mainsail.	Jibs.	Boat covers.
1st Div. M. S. N. B.	4	38	12	1	4	2	2	12	6	3	3	3	3	3	3	3	3
2d " " " " "	....	28	6	....	....	4	2	4	....	...	....	...	....	....	...	....	....

Naval Stores Loaned to M. S. N. B.—Continued.

To whom loaned.	Tarpaulins.	Boat fenders.	Trailing lines.	Awnings.	Awning bags.	Cushions, sets.	Cushion bags.	Cushion covers.	Boat painters.	Boat brails.	Jib halyards.	Anchors.	Chains.	Grapnels.
1st Div. M. S. N. B.	3	18	36	2	2	2	2	2	2	4	2	...	....	....
2d " " " " "	......	.....	......	......	......	2	2	....	2	....	....	2	2	2

Naval Stores issued to the State of Michigan for the use of the Uniformed Naval Militia under Act of Congress.

From whom received.	Date.	Revolvers, 38 cal.	Revolver holsters.	Cartridge boxes.	Revolver belts.	Revolver ball cartridges.	Rifle ball cartridges, cal. 45.	Shrapnel 3".	Complete charges, 3".	Shells, 3".	Charges 3".	Dummy charges 3".	Dummy projectile 3".
U. S. Nav. Dept..	1894	50	50	50		2,000							
" " " "	1895												
" " " "	March 1, 1896				11	2,000	10,000						
" " " "	April 11, 1896												
" " " "	May 15, 1896	14	14	14				30	7	10	44	1	1
Total.........		64	64	64	11	4,000	10,000	30	7	10	44	1	1

Naval Stores Issued by U. S.—Continued.

From whom received.	Date.	Boxer fuses.	Mounted fuses, sets.	Gun slings.	Boat signal flags.	Single sticks.	Clothes bags.	Haversacks.	Haversack straps.	Canteens.	Canteen straps.	Leggings, pairs.	Fuse cutters, boxes.
U. S. Nav. Dept.	1894												
" " " "	1895						120						
" " " "	March 1, 1896						88	105	105	205	205	24	
" " " "	April 11, 1896			70	2			100	100				
" " " "	May 15, 1896	44	2			12							3
Total.........		44	2	70	2	12	208	205	205	205	205	24	3

Naval Stores Issued to Michigan State Naval Brigade July 1, 1894 to June 30, 1896.

To whom issued.	When issued.	Revolvers, 38 cal.	Revolver holsters.	Cartridge boxes.	Revolver ball cartridges.	Rifle ball cartridges.	Rifle blank cartridges.	Shrapnel 3".	Shells 3".	Boxer fuses.	Fuses mounted, sets.	Fuse cutters, boxer.	Boat signal flags, sets.	Clothes bags.	Haversacks.
1st Div. M. S. N. B....	1894 1895 1896	50	50	50	3,000	5,000	1,000	20	10	30	1	2	1	70	70
2d Div. M. S. N. B....	1894 1895 1896	14	14	..	1,000	.....	....	10	....	14	1	1	1	68	65
3d Div. M. S. N. B....	1894 1895 1896	....	...	....	1,000	5,000	.....	...	...	...	..	....	....	70	70

Naval Stores Issued to M. S. N. B.—Continued.

To whom issued.	When issued.	Haversack straps.	Canteens.	Canteen straps.	Leggings.	Revolver belts.	Complete charges 3".	Dummy charges 3".	Dummy projectile.	Single sticks.	Gun slings.
1st Div. M. S. N. B....	1894 1895 1896	70	70	70	12	......	......	......	......	......	......
2d Div. M. S. N. B....	1894 1895 1896	65	65	65	11	......	7	1	1	12	70
3d Div. M. S. N. B....	1894 1895 1896	70	70	70	12	......	......	......	......	......	......

All of which is most respectfully submitted.

Your obedient servant,

J. H. KIDD,

Brigadier General and Quartermaster General.

EXHIBIT A.

September 5, 1895.

J. H. Kidd, Quartermaster General, Ionia, Mich.:

Sir—On Saturday, August 28, at 5:30 o'clock p. m., I was notified by the Assistant Adjutant General that the Commander-in-Chief had ordered four companies of the Fifth Infantry to proceed to Ishpeming, under requisition of the Sheriff of Marquette County. I immediately telephoned the agent of the M. C. R. R., to hold the 6:15 train going north until I could put on board the train camp equipage and ammunition; this was readily granted by the Division Superintendent. I got away from here at 6:30 with eighty-seven (87) 9x9 tents, poles and pins, one hundred blankets, five hundred bed-sacks, and five thousand ball cartridges, leaving orders with the Armorer to forward on first train thirteen 9x9, twenty-five 9x12 tents, twenty-five 9x12 flies, five thousand ball cartridges and all of the dark blue overcoats in the Armory. On arrival at Bay City I was compelled to tranship the stores. Before leaving Bay City I was notified that Co. H, Fifth Infantry, would be in readiness and to provide transportation for that company. On arrival at Cheboygan, W. S. McArthur, Captain commanding Co. H., Third Infantry, reported with three officers and fifty-two enlisted men. On arrival at Mackinaw City I was again compelled to tranship the Ordnance and Quartermaster's stores to a D. S. S. & A. baggage car, which had been provided at the request of the Governor; however I had telegraphed from Bay City to Gen. Manager W. F. Fitch, of the D. S. S. & A. R. R. Co., to provide extra baggage car and coach for use of military en route to Ishpeming. I found them both placed alongside the M. C. R. R. track and very convenient for transfer, and with the assistance of Capt. McArthur the transfer was quickly made, causing no delay, the transfer being made inside of twenty minutes. Arrived at Marquette at 3:45 p. m., where I opened communication with Col. F. B. Lyon, at Ishpeming, who requested me to lay in Marquette until about 2:30 a. m. of the 29th, and arrange to arrive at Ishpeming at 4 o'clock a. m. of the 9th. I arrived at Ishpeming at 3:57 a. m. of the 9th with Companies H, Third Infantry and G, Fifth Infantry, and the stores, immediately unloaded and went into camp on ground selected by Col. Lyon; at 6:45 the tents were erected and the men given a lunch, from cooked meats furnished by Col. Lyon. During the day the camp was put in good condition by Capt. McArthur's men, kitchens and mess tents erected, a pipe line run from the Lake Superior Mining Company's pumping house and at 10 a. m. was receiving water through it. The camp is situated on Superior Bluff, overlooking the city of Ishpeming, the shaft houses of the Lake Superior, Lake Angeline and Saulsbury Mining Companies, any of which can be reached from the camp in seventeen minutes.

Having fully established the camp and completed arrangements for provisioning the camp, at noon of September 4th, I took the 12:35 p. m. train, arriving home at 9:05 this a. m. I have the honor to report that 100 9x9, 25 9x12, and 1 16x32 tents, 25 9x12 tent files, 100 woolen blankets, 500 bed sacks, 130 ridge poles, 260 upright poles, one saddle and bridle were turned over to Col. Lyon for use in Camp Ishpeming to be returned to this Department at the close of said camp. I further report the camp to be situated in a healthful place and very satisfactory to Col. Lyon and Surgeons McLeod and Bailey.

I am very respectfully yours, etc.,

S. H AVERY,

Lt. Col. and Asst. Q. M. Gen.

APPENDIX

Ordnance, ordnance stores, appendages, etc., on hand July 1, 1894. Received, issued, condemned, lost or destroyed and remaining on hand June 30, 1896.

From whom received.	When received.	Gatling gun, cal. 1".	Gatling gun carriage.	Gatling gun chest.	Gatling gun jacket.	Gatling gun limber.	Parrot guns, 3".	Parrot gun carriages.	Parrot gun limbers.	Parrot gun chests.	Brass gun, 4 pounder.	Brass gun carriage.	Brass gun limber.	Brass gun chest.	Brass howitzer, unmounted.	Rammers and sponges.	Gunner's haversacks.	Sets double harness.	Halters.	Bridles, complete.	Saddles.	Housings, Gen. officer.	Saddle cloth, general staff.	Saddle cloth, officers of infantry.	Lower bands.	Trigger screws.	Guard screws.	Guard bow nuts.	Tip screws.
On hand from last report	June 30, 1894	1	1	1	1	1	2	3	3	3	1	1	1	1	1	9	3	6	8	17	21	3	10	2					
United States	July 16, 1894																			5	5		5	10					
United States	July 28, 1894																												
United States	August 7, 1894																												
United States	May 16, 1895																								25	50	25	25	25
United States	May 27, 1895																												
United States	July 9, 1895																												
United States	July 10, 1895																					2							
United States	July 10, 1895																			10									
United States	August 5, 1895																												
United States	August 5, 1895																												
United States	August 26, 1895																												
United States	April 7, 1896																												
Bonded officers, M. N G.	July 1, 1894, to June 30, 1896.																												
Purchased	July 1, 1894, to June 30, 1896.																												
Total to be accounted for		1	1	1	1	1	2	3	3	3	1	1	1	1	1	9	3	6	8	32	26	5	15	12	25	50	25	25	25
Issued to bonded officers, M. N. G.																					2			7					
Condemned																													
Expended																2									25	10	25	25	25
Lost or destroyed, camp 1894																													
Lost or destroyed, camp 1895																													
Lost or destroyed, in hand of bonded officers																													
Purchased																													
Total issued, condemned, etc.																2								7	25	10	25	25	25
On hand June 30, 1896		1	1	1	1	1	2	3	3	3	1	1	1	1	1	7	8	6	8	32	24	5	15	5		40			

Ordnance, ordnance stores, appendages, etc.—Continued.

From whom received.	When received.	Spurs, complete pairs.	Guidon sockets.	Thumb stalls.	Springfield rifles, cal. 45.	Bayonets.	Bayonet scabbards.	Breech B cap screws.	Spring vises.	Tumbler punches.	Headless shell extractors.	Bridles.	Bridle screws.	Cam latch springs.	Extractors.	Ejector springs and spindles.	Firing pins.	Firing pin screws.	Main springs.	Sears.	Sear screws.	Tumblers.	Tumbler screws.	Hammers.	Side screws.	Side screw washers.
On hand from last report	June 30, 1894	35	1	6	26		65	20	30	140	1,073	111	25	44	100	100	224	25	96	77	24	186	244	24	4	12
United States	July 16, 1894						300																			
United States	July 28, 1894																									
United States	August 7, 1894																									
United States	May 16, 1895							50							25	100	100	50	50			100	50	25	100	
United States	May 27, 1895																									
United States	July 9, 1895																									
United States	July 10, 1895																									
United States	July 10, 1895																									
United States	August 5, 1895																									
United States	August 5, 1895																									
United States	August 26, 1895																									
United States	April 7, 1896					100										200	500									
Bonded officers, M. N. G.	July 1, 1894, to June 30, 1896.				40	42								56	28											
Purchased	July 1, 1894, to June 30, 1896.																									
Total to be accounted for		35	1	6	66	142	365	70	30	140	1,073	111	25	100	153	400	824	75	146	77	24	286	294	49	104	12
Issued to bonded officers of M. N. G.		20					244	40	25		893	31	15			359	524	40	136	67	1	261	257	30	63	
Condemned																										
Expended																								8	31	7
Lost or destroyed, camp 1894			1	2																						
Lost or destroyed, camp 1895				2																						
Lost or destroyed, in hands of bonded officers		6																								
Purchased																										
Total issued, condemned, etc.		26	1	4			244	40	25		893	31	15			359	524	40	136	67	1	261	257	38	94	
On hand June 30, 1896		9		2	66	142	121	25	5	140	180	80	10	100	153	41	300	35	10	10	23	25	37	11	10	5

Ordnance, ordnance stores, appendages, etc.—Continued.

From whom received.	When received.	Front sights, model 1884.	Front sight-pins.	Rear sights, model 1884.	Tang screws.	Main spring swivels.	Main spring swivel rivets.	Upper bands.	Bayonet clasps.	Bayonet clasp screws.	Breech blocks.	Triggers.	Stocks.	Guard bow swivels.	Guard bow swivel rivets.	Combination screw drivers.	Wiping rods.	Gun slings.	Waist belts.	Waist belt plates.	Cartridge belts.	Cartridge belt plates.	Cartridge boxes.	Knapsacks.	Swords.	Sword scabbards.	Sabres.	Sabre scabbards.	Chamois sword and sabre cases.	Revolvers, S. and W.	Hinge pins.
On hand from last report	June 30, 1894							15			50	4				301	130	230	24	24	25	25	38	9	6					2	
United States	July 16, 1894																		300	300			300				5	5			
United States	July 28, 1894																														
United States	Aug. 7, 1894																														
United States	May 16, 1895			50	100	100	100	100	25	50		25	50	25	25																25
United States	May 27, 1895	2,000	2,000																												
United States	July 9, 1895																								11	11	5	5	16		
United States	July 10, 1895																														
United States	July 10, 1895																														
United States	Aug 5, 1895																														
United States	Aug. 5, 1895																														
United States	Aug. 26, 1895																														
United States	April 7, 1896			100																											
Bonded officers, M. N. G.	July 1, 1894, to June 30, 1896.										4													186	2	8					
Purchased	July 1, 1894, to June 30, 1896.																														
Total to be accounted for		2,000	2,000	150	100	100	100	115	25	50	54	29	50	25	25	301	130	230	324	324	25	25	338	195	19	19	10	10	16	2	25
Issued to bonded officers of M. N. G.				92	20	100	100	50	25	50		6	50	21	18	295	62	67	270	252			196				9	9	5		20
Condemned				58	15			5						4	7		38				25	25									5
Expended																															
Lost or destroyed, camp 1894																															
Lost or destroyed, camp 1895																															
Lost or destroyed in hands of bonded officers																															
Total issued, condemned, etc		2,000	2,000	150	35	100	100	55	25	50		6		25	25	295	100	67	270	252	25	25	196				9	9	5		25
On hand June 30, 1896					65			60			54	23				6	30	163	54	72			142	195	19	19	1	1	11	2	

Ordnance, ordnance stores, appendages, etc.—Continued.

From whom received.	When received.	Canteens.	Canteen straps.	Haversacks.	Haversack straps.	Ball cartridges, gatling gun.	Canister cartridges, gatling gun.	Conical shell, 3 inch.	Blank cartridges, 3 inch.	Friction primers.	Ball cartridges, cal. 45.	Ball cartridges, revolver.	Blank cartridges, cal. 45.	Braces, hand.	Brace bits.	Brace screw drivers.	Hammers.	Pliers.	Saws, hand.	Wrenches, mongrel.	Squares, steel.	Bench vises.	Oil cans, gallon.	Oil cans, bench.	Sear springs.	Instruction book, Springfield rifle.	Torches.	Sprinklers.	Water troughs.	Stone boats.	Windage screws, heads and pins.	Leaf slide binding screws.
On hand from last report	June 30, 1894			15	15	1,600	1,983	90	101	20	3,000	1,000	29,000	1	4	1	2	1	2	1	2	2	4	1	69	1	6	1	2	2		
United States	July 16, 1894										40,000		10,000																			
United States	July 28, 1894																															
United States	Aug. 7, 1894									500	50,000																					
United States	May 16, 1895																														50	50
United States	May 27, 1895																															
United States	July 9, 1895																															
United States	July 10, 1895																															
United States	July 10, 1895										50,000		10,000																			
United States	Aug. 5, 1895					1,000	1,000																									
United States	Aug. 5, 1895																															
United States	Aug. 26, 1895																															
United States	April 7, 1896																															
Bonded officers, M. N. G.	July 1, 1894, to June 30, 1896	50	50	41	37																											
Purchased	July 1, 1894, to June 30, 1896																10		6		4		12				36					
Total to be accounted for		50	50	56	52	2,600	2,983	90	101	520	148,000	1,000	49,000	1	4	1	12	1	8	1	6	2	16	1	69	1	42	1	2	2	50	50
Issued to bonded officers of M. N. G.											80,000		15,000												46						39	46
Condemned								90	101														2				6					
Expended						1,600	1,983			170	13,000	1,000	12,000																		11	4
Lost or destroyed, camp 1894																	1		3		3		6				3					
Lost or destroyed, camp 1895																	10		1		1		2				1					
Lost or destroyed in hands of bonded officers																																
Total issued, condemned, etc.						1,600	1,983	90	101	170	93,000	1,000	27,000				11		4		4		10				10				50	50
On hand June 30, 1896		50	50	56	52	1,000	1,000			350	50,000		22,000	1	4	1	1	1	4	1	2	2	6	1	23	1	32	1	2	2		

Ordnance, ordnance stores, appendages, etc.—Continued.

From whom received.	When received.	Front sight covers.	Guard bows.	Guard bow plates.	Side plates.	Ramrods.	Paper targets.	Centers for paper targets.	Shot marks or pasters.
On hand from last report	June 30, 1894	50							
United States	July 16, 1894								
United States	July 28, 1894								
United States	August 7, 1894								
United States	May 16, 1895								
United States	May 27, 1895								
United States	July 9, 1895								
United States	July 10, 1895								
United States	July 10, 1895								
United States	August 5, 1895						1,000	1,000	
United States	August 5, 1895								20,000
United States	August 28, 1895								
United States	April 7, 1896		7	7	8	25			
Bonded officers, M. N. G.	July 1, 1894 to June 30, 1896.								
Purchased	July 1, 1894 to June 30, 1896.								
Total to be accounted for		50	7	7	8	25	1,000	1,000	20,000
Issued to bonded officers of M. N. G.									
Condemned									
Expended						15	1,000	1,000	20,000
Lost or destroyed, camp 1894									
Lost or destroyed, camp 1895									
Lost or destroyed, in hands of bonded officers									
Total issued, condemned, etc						15	1,000	1,000	20,000
On hand June 30, 1896		50	7	7	8	10			

Clothing, camp and garrison equipage and quartermasters' stores on hand July 1, 1894, received, issued, condemned, lost or destroyed and remaining on hand June 30, 1896.

From whom received.	When received.	Helmets.	Campaign hats.	Forage caps.	Overcoats.	Uniform coats.	Uniform coats, musicians'.	Blouses.	Trousers.	Leggins, pairs.	Crossed rifles.	Crossed rifles, letters and figures.	Letters, white.	Letters, brass.	Figures, white.	Figures, brass.	Chevrons, S. M. dress.	Chevrons, S. M. fatigue.	Chevrons, Q. M. Sergt., dress.	Chevrons, Q. M. Sergt., fatigue.	Chevrons, Color S., dress.	Chevrons, Color S., fatigue.	Chevrons, Hosp. Steward, dress.
On hand from last report	June 30, 1894	320	24	224	1,128	30	64	104	85	3	250	953	1,116	2,478	3,758	992				2			
United States	July 13, 1894	200	2,275	400					600	600							2	5	2	5	2	5	4
United States	July 16, 1894																						
United States	July 16, 1894							600															
United States	July 20, 1894		225																				
United States	July 12, 1895	200	500	200	300	100		400	500												5	10	
United States	July 24, 1895									100													
United States	August 5, 1895									400							4						
United States	Sept. 24, 1895																		1				
Bonded officers, M. N. G.	June 30, 1894 to June 30, 1896.	2,322		590	479	2,371	96	399	463	285									3	6	12		
Taken up	June 30, 1894 to June 30, 1896.											8,000											
Total to be accounted for		3,022	3,024	1,414	1,907	2,501	160	1,503	1,648	1,388	250	8,953	1,116	2,478	3,758	992	6	5	6	13	19	15	4
Issued to bonded officers, M. N. G.		62	2,922	444	1,722			1,003	952	934		7,663						3	2	13		11	1
Condemned by Inspector General											250		1,116	2,478	3,758	992					9		
Lost or destroyed in hands of bonded officers																					10		
Lost or destroyed, camp 1894																							
Lost or destroyed, camp 1895																							
Lost or destroyed, riot camp at Ishpeming Sept., 1895																							
Total issued, condemned, lost, etc.			2,922	444	1,722			1,003	952		250	7,663	1,116	2,478	3,758	992		3	2	13	19	11	1
On hand to be accounted for		2,960	102	970	185	2,501	160	500	696	454		1,290					6	2	4		9	4	3

Clothing, etc.—Continued.

From whom received.	When received.	Chevrons, hospital steward, fatigue.	Chevrons, prin. musician, dress	Chevrons, prin. musician, fatigue.	Chevrons, ordinance sergeant, fatigue.	Chevrons, 1st sergeant, dress.	Chevrons, 1st sergeant, fatigue.	Chevrons, sergeant, dress.	Chevrons, sergeant, fatigue.	Chevrons, corporal, dress.	Chevrons, corporal, fatigue	Chevrons, service, war.	Chevrons, service, peace.	Trousers stripes, sergeant.	Trousers stripes, corporal.	Trousers stripes, musician.	Blankets.	Bed sacks.	Mattresses, bed.	Mattresses, cot.	Tents, wall, 7x7.	Tents, wall, 9x9.	Tents, wall, 9x12.
On hand last report	June 30, 1894	4			2	5				½		50	253	92	268		277	1,340		109	29	454	117
United States	July 1, 1894	5	5	5		10	10	25	100	50	100						200						
United States	July 16, 1894																						
United States	July 16, 1894																						
Unit-d States	July 20, 1894																						
United States	July 12, 1895								50		100						500					100	
United States	July 24, 1895																						
United States	Aug. 5, 1895																						
United States	Sept. 24, 1895																						
Bonded officers, M. N. G.	July 1, 1894, to June 30, 1896.		1			39		242		238½													
Taken up	July 1, 1894, to June 30, 1896.																	32	6				
Totals to be accounted for		9	6	5	2	54	10	267	150	289	200	50	253	92	268		977	1,372	6	109	29	554	117
Issued to bonded officers		3					3		67		138			62	220		463						
Condemned by Insp. Gen.												50	253										
Lost or destroyed in hands of bonded officers																							
Lost or d-stroyed, camp 1894																				22	8	6	
Lost or destroyed, camp 1895																				15			
Lost or destroyed, riot camp at Ishpeming, Sept., 1895																							
Total issued, etc.		3					3		67		188	50	253	62	220		463			37	8		
On hand		6	6	5	2	54	7	267	83	289	62			30	48		514	1,372	6	72	26	548	117

Clothing, etc.—Continued.

From whom received.	When received.	Tents, wall, 11x14.	Tents, wall, 12x18.	Tents, mess, 16x32.	Tents, hospital.	Tent, flies, hospital.	Tent, flies, 9x9.	Tent, flies, 9x12.	Tent, flies, 11x14.	Tent, flies, 12x18.	Wagon paulins.	Ambulance paulins.	Ambulances.	Flags, U. S., silk.	Flags, State, silk.	Flags, garrison.	Flags, camp.	Flags, hospital.	Flags, pennant, brigade.	Flags, Q. M. D.	Guidons.	Flag, halyards.	Flag slings.	Flags, target.
On hand from last report	June 30, 1894	6	8	46	2	2	97	84	7	8	1	0	1	2		1	4	1	1	1		6	2	7
United States	July 1, 1894																							
United States	July 16, 1894											1	1											
United States	July 16, 1894																							
United States	July 20, 1894																							
United States	July 12, 1895																							
United States	July 24, 1895																							
United States	Aug. 5, 1895																							
United States	Sept. 24, 1895																							
Bonded officers, M. N. G.	July 1, 1894, to June 30, 1896.																							
Taken up	July 1, 1894, to June 30, 1896.										1	1			1						4	1		
Total to be accounted for		6	8	40	2	2	97	84	7	8	2	2	2	2	1	1	4		1	1	4	7	2	7
Issued to bonded officers																							2	
Condemned by inspector general														1			2							
Lost or destroyed in hands of bonded officers																								
Lost or destroyed, camp 1894																								4
Lost or destroyed, camp 1895																								3
Lost or destroyed, riot camp at Ishpeming, Sept., 1895		1		1				10	1															
Used in repairing tents							26	13																
Total issued, condemned, etc		1		1			26	23						1			2						2	7
On hand to be accounted for		5	8	45	2	2	71	61	6	8	2	2	2	1	1	1	2	1	1	1	4	7		

Clothing, etc.—Continued.

From whom received.	When received.	Helmet bases.	Helmet spikes.	Helmet side buttons.	Helmet eagles.	Cap bugles.	Lyres.	Helmet side button—Hospital stewards.	Brassards, white.	Berlin gloves.	Stripes—Hospital corps.	Surgical instruments.	Litters.	Cots.
On hand from last report	June 30, 1894	57	61	245	170	14		43		16	64	27	5	56
United States	July 1, 1894	200	200	200	200				50					
United States	July 16, 1894													
United States	July 16, 1894													
United States	July 20, 1894													
United States	July 12, 1895	200	200	400	200	50	50							
United States	July 24, 1895													
United States	Aug. 5, 1895													
United States	Sept. 24, 1895													
Bonded officers, M. N. G.	July 1, 1894, to June 30, 1896													
Taken up	July 1, 1894, to June 30, 1896.												6	
Total to be accounted for		457	461	845	570	64	50	43	50	16	64	27	11	56
Issued to bonded officers, M. N. G.		400	451	845	570	56	43	43	50		64			
Condemned by Inspector General										16				
Lost or destroyed in hands of bonded officers		57	10			8	7							
Lost or destroyed, camp 1894														6
Lost or destroyed, camp 1895														4
Lost or destroyed, riot camp at Ishpeming, Sept. 1895														
Total issued, condemned, etc.		457	461	845	570	64	50	43	50	16	64			10
On hand												27	11	46

Clothing, etc.—Continued.

From whom received.	When received	Rosters, commissioned officers.	Duty books.	Enlistment records.	Drill regulations, U. S.	Laws, rules and regulations.	Blunt's small arm firing.	Order books.	Manuals of guard duty.	Information and security.	Camp chairs.	Camp tables.	Pails, paper.	Pails, wooden.	Tin cups.	Tin wash basins.	Spades and shovels.	Pick axes.	Axes.	Rakes.	Rakes, iron.	Brooms.	Lanterns.	Iron mauls.
On hand from last report	June 30, 1894	6	11	34	41	200					2	101	42	15	219	278	6		28	2	126	6	4	10
United States	July 1, 1894																							
United States	July 16, 1894																							
United States	July 16, 1894																							
United States	July 20, 1894																							
United States	July 12, 1895																							
United States	July 24, 1895																							
United States	Aug. 5, 1895																							
United States	Sept. 24, 1895																							
Bonded officers, M. N. G.	July 1, 1894, to June 30, 1896																							
Taken up	July 1, 1894, to June 30, 1896						1	60	1,000	90	400		24		248	144	12	1			10	96	50	50
Total to be accounted for		6	11	34	41	200	1	60	1,000	90	402	101	66	15	467	422	18	1	28	2	136	102	54	60
Issued to bonded officers, M. N. G.		2	6	32	38	105		5	802	82														
Condemned by Inspector General																								
Lost in hands of bonded officers																								
Lost or destroyed, camp 1894													9	7	165	161	10		5	2	18	6	6	
Lost or destroyed, camp 1895											19	16		8	83	133	2		4		20	7	4	3
Lost or destroyed, riot camp at Ishpeming, Sept. 1895																					8		4	
Total issued, condemned, etc		2	6	32	38	105		5	802	82	19	16	9	15	248	294	12		9	2	46	13	14	3
On hand		4	5	2	3	95	1	55	198	8	383	85	57		219	128	6	1	19		90	89	40	57

Clothing, Etc.—Concluded.

From whom received.	When received.	Stables.	Guard houses.	Market.	Store houses.	Kitchens.	Sinks.	Flag poles.	Garden hose, feet.	Hose bibbs.	Hose nozzles.	Tent floors.	Mess tables.	Water barrels.	Slop buckets.	Bed bottoms, woven wire.	Bedsteads.	Bunks, wooden.	Box stoves.	Gasoline stoves.	Scoring disks.	Baskets.	Slop pails.	Monkey wrench.
On hand from last report	June 30, 1894	1	5	1	15	50	32	4	600	22	10	630	130	50	50									
United States	July 1, 1894																							
United States	July 16, 1894																							1
United States	July 16, 1894																							
United States	July 20, 1894																							
United States	July 12, 1895																							
United States	July 24, 1895																							
United States	Aug. 5, 1895																							
United States	Sept. 24, 1895																							
Bonded officers M. N. G.	July 1, 1894 to June 30, 1896.																							
Taken up	July 1, 1894 to June 30, 1896.		1			2	4		400	6	10	115	26	10		18	24	66	1	2	22	16	12	
Total to be accounted for		1	6	1	15	52	36	4	1000	28	20	745	156	60	50	18	24	66	1	2	22	16	12	1
Issued to bonded officers																								
Condemned by inspector general																								
Lost or destroyed in hands of bonded officers																								
Lost or destroyed, camp 1894						2	2	1	200	4	6	12	14	6	3									
Lost or destroyed, camp 1895			1				2	1	250	2	4	23	12	4	7									
Lost or destroyed, riot camp at Ishpeming, Sept., 1895																								
Total issued, condemned, etc.			1			2	4	2	450	6	10	35	26	10	10									
On hand		1	5	1	15	50	32	2	550	22	10	710	130	50	40	18	24	66	1	2	22	16	12	1

Clothing, Etc.—Continued.

From whom received.	When received.	Cuspidors.	Candle sticks.	Lamps.	Bed pans.	Matting, yards.	Wall tent poles, upright.	Wall tent poles, ridge.	Wall tent pins, large.	Wall tent pins, small.
On hand from last report	June 30, 1894	..	..	..	....	....	.....	.....	......	......
United States	July 13, 1894	...	..	....	...	....	.....	.....	......	......
United States	July 16, 1894	...	..	..		..	....		......	......
United States	July 16, 1894	....	..	...	...	....	......	....	......	......
United States	July 20, 1894	....	..	...	...	..	.....	.....	......	......
United States	July 12, 1895	....	...	...	....	..	200	100	2,000	1,800
United States	July 24, 1895	....	....	..	....	..	.....	....	1,000	......
United States	Aug. 5, 1895	....	....	...	....	..	.....	.....	......	......
United States	Sept. 24, 1895	..	...	....	..	...	......	.....	......	......
Bonded officers M. N. G.	July 1, 1894 to June 30, 1896	...	....	....	....	...	.....	.....	......	......
Taken up	July 1, 1894 to June 30, 1896	6	100	90	2	57	1,351	901	9,510	16,522
Total to be accounted for		6	100	90	2	57	1,551	1,001	12,510	18,322
Issued to bonded officers		..	....	..	..	...	......	.....	......	......
Condemned by inspector general		....	....	....	....	....	.....	......	......	......
Lost or destroyed in hands of bonded officers		....	....	....	....	....	......	......	......	......
Lost or destroyed, camp 1894		..	...	....	....	....	11	9	1,200	1,430
Lost or destroyed, camp 1895		...	....	....	...	..	6	12	1,400	1,116
Lost or destroyed, riot camp at Ishpeming, Sept., 1895		..	....	...	....	....	56	41	603	1,205
Total issued, condemned, etc.		....	....	..	....	...	73	62	3,203	3,751
On hand, etc.		6	100	90	2	57	1,478	939	9,307	14,571

Ordnance, ordnance stores, clothing and quartermaster stores in possession of bonded officers June 30, 1896.

Articles.	A. Q. M. G., 1st brigade.	First Infantry.										Total.
		Quartermaster.	Adjutant.	Company.								
				A	B	C	D.	E	F	G	H	
Small arms, appendages, accoutrements, etc.:												
Springfield rifles, cal. 45	----	----	----	50	50	49	58	49	49	52	60	417
" " Bayonets	----	----	----	50	50	50	58	52	50	47	60	417
Bayonet scabbards	---	----	----	65	50	48	76	53	52	49	60	453
Gun slings	---	----	----	50	50	49	52	49	49	55	60	414
Cartridge boxes	----	----	----	63	50	50	79	50	53	49	60	454
Waist belts	1	1	22	63	50	50	78	63	50	49	60	487
Waist belt plates	1	1	22	65	50	50	78	63	51	49	60	490
Knapsacks	---	----	----	64	48	50	55	47	45	45	------	354
Canteens	----	----	----	41	50	50	50	50	51	40	50	382
Canteen straps	----	----	----	38	50	50	47	50	50	41	50	377
Haversacks	----	--	----	42	49	48	50	50	50	50	50	389
Haversack straps	----	----	----	41	49	48	48	50	50	50	50	386
B. B. capscrews	----	----	----	------	1	------	------	------	2	-----	------	3
Spring or thumb vises	----	----	----	1	1	------	1	----	1	-----	------	4
Tumblers	----	----	----	------	------	----	------	------	-----	4	----	4
Tumbler punches	----	----	----	1	4	---	2	2	------	----	------	9
Sight covers	----	----	----	------	-----	50	27	------	------	------	----	77
Headless shell extractors	----	----	----	4	20	14	17	6	------	------	------	61
Bridles	----	----	----	1	2	----	-----	------	-----	-----	-----	3
Bridle screws	----	----	----	-----	2	------	------	------	----	-----	------	2
Cam latch springs	----	----	----	------	2	------	-----	-----	--	-----	----	2
Extractors	----	----	----	-----	2	-----	----	------	2	-----	----	4
Ejectors	---	----	---	------	------	-----	--	-----	----	-----	----	---
Ejector springs and spindles	----	----	----	------	3	------	12	-----	------	----	----	15
Combination screwdrivers	----	----	----	4	10	20	2	------	20	-----	------	56
Firing pins	---	----	----	6	------	-----	7	------	------	12	------	25
Firing pin screws	----	----	----	------	1	-----	10	------	------	-----	------	11
Main springs	----	----	----	1	2	------	----	------	-----	-----	----	3
Sears	----	----	---	------	-- --	---	-----	-----	-----	-----	----	------
Sear springs	---	----	----	------	1	----	-----	------	------	4	------	5
Sear screws	---	----	----	1	2	-----	---	------	-----	----	-----	3
Tumbler or hammer screws	---	----	----	3	------	------	10	-----	-----	4	------	17
Wiping rods	---	----	----	------	9	----	----	12	5	6	----	32
Arm chests	---	----	----	------	-----	------	----	------	2	-----	------	2
Field guns, equipments, etc.:												
Parrott gun and carriage	---	----	----	------	------	------	------	-----	------	------	------	------
Parrott gun, limber and chest	---	----	----	------	------	------	------	------	------	------	------	------
Ammunition:												
Ball cartridges, cal. 45	---	---	----	2,340	1,200	150	1,900	-----	2,000	2,000	1,000	10,590
Blank cartridges, cal. 45	---	----	----	400	-----	------	-----	150	------	-----	-----	550
Swords and sabres, etc.:												
Officers swords	4	----	----	3	3	3	3	3	3	3	3	28
Scabbards	4	--	---	3	3	3	3	3	3	3	3	28
Officers sabres	----	3	----	------	------	------	-----	------	-----	-----	----	3
Scabbards	----	3	----	------	----	------	------	-----	-----	-----	----	3
Chamois sword and sabre cases	4	3	----	--- -	3	------	------	3	1	-----	-----	14
N. C. O. swords	----	2	----	------	------	----	------	------	------	-----	------	2
N. C. O. scabbards	----	2	----	------	-----	------	------	------	------	------	------	2
Horse equipments:												
Saddles	5	7	----	-----	-----	-----	-----	-----	------	------	------	12
Bridles	6	7	----	------	-----	------	------	------	------	------	-----	13
Housings, Gen. officer	1	----	----	------	------	------	------	------	-----	-----	------	1
Saddle cloths, Gen. staff officers	4	----	----	------	------	----	------	------	------	-----	------	4
Saddle cloths, officers of infantry	1	7	----	------	----	------	------	----	----	------	-----	8
Spurs, pairs	5	6	----	------	------	------	------	----	-----	-----	------	11
Colors and standards:												
U. S. flags, silk	----	1	----	------	------	------	------	------	------	-----	------	1
State flags, silk	----	1	----	------	------	----	------	------	------	-----	------	1
Flag staffs, jointed	----	2	----	------	------	-----	------	------	------	------	------	2
Guidons	----	4	---	-----	------	------	----	------	------	------	------	4

Ordnance, ordnance stores, clothing, etc.—Continued.

Articles.	A. Q. M., G. 1st brigade.	First Infantry.										Total.
		Quarter-master.	Adjutant.	Company.								
				A	B	C	D	E	F	G	H	
Clothing:												
Helmets, complete	1	1	20	......	......	......	......	....	......	......	......	22
Campaign hats	1	3	21	78	57	56	54	60	60	55	60	505
Forage caps	2	1	20	78	67	62	60	71	59	54	60	534
Great coats	2	6	20	38	44	40	38	40	42	42	40	354
Uniform coats	1	....	4	......	......	......	......	1	......	......	......	6
Uniform coats, musicians	....	....	22	......	......	......	......	......	......	......	......	22
Blouses	2	3	20	78	70	67	92	68	66	57	60	583
Trousers	1	7	26	78	74	86	76	75	71	59	60	613
Blankets	33	4	20	60	94	82	71	65	58	52	58	591
Crossed rifles. letters and figures	....	....	....	78	93	19	93	101	59	33	60	536
Leggins, pairs	1	5	21	78	46	50	46	63	56	61	60	487
Letters	....	....	....	......	......	......	......	......	......	......	......	......
Figures	....	....	....	......	......	......	......	......	......	......	......	......
Bugles for caps	1	....	....	......	......	......	......	......	......	......	......	1
Cloth chevrons, segt. major, prs.	....	2	....	......	......	......	......	......	......	......	......	2
Cloth chevrons, Q. M. sergt., prs.	....	2	....	......	......	......	......	......	......	......	......	2
Cloth chevrons, color sergt., prs.	....	2	....	......	......	......	......	......	......	......	......	2
Cloth chevrons, H. S., prs.	1	....	....	......	......	......	......	......	......	......	......	1
Cloth chevrons, P. M., prs.	1	....	1	......	......	......	......	......	......	......	......	2
Cloth chevrons, first sergt., prs.	....	....	....	1	1	2	1	2	1	1	1	10
Cloth chevrons, sergeant, prs.	....	....	....	9	6	4	5	2	5	4	7	42
Cloth chevrons, corporal, prs.	....	....	....	16	8	8	8	8	7	8	14	82
Chevrons, gold lace, sergeant major, prs.	....	1	....	......	......	......	......	......	......	......	......	1
Chevrons, gold lace, Q. M. sergt., prs.	....	3	....	......	......	......	......	......	......	......	......	3
Chevrons, gold lace, color sergt., prs.	....	1	....	......	......	......	......	......	......	......	......	1
Chevrons, gold lace, hospital steward, prs.	2	....	....	......	......	......	......	......	......	......	......	2
Chevrons, gold lace, principal musician, prs.	1	....	1	......	......	......	......	......	......	......	......	2
Chevrons, gold lace, war service, prs	....	....	....	......	......	......	......	......	......	......	......	......
Chevrons, gold lace, state service, prs.	....	....	....	......	......	......	20	20	......	......	......	40
Trousers stripes, sergeant, prs.	....	4	....	5	11	5	5	10	5	5	8	58
Trousers stripes, corporal, prs.	....	....	....	3	8	8	7	20	7	8	14	75
Trousers stripes, musicians, prs.	....	....	....	3	......	......	......	2	......	......	......	5
Books:												
Laws, rules and regulations	15	15	1	1	5	5	2	5	5	3	1	58
Duty books	....	....	....	1	1	2	1	1	1	1	1	9
Enlistment records	....	....	....	1	1	2	2	1	1	1	1	10
U. S. drill regulations	6	....	2	4	5	5	1	5	5	2	1	36
Blunt's small arm firing	....	....	....	1	1	1	1	1	......	......	......	5
Manuals of guard duty	....	....	5	6	10	10	30	10	11	12	17	111
Security and information	....	4	...	1	1	1	1	1	1	1	1	12
Order books	....	....	....	......	......	......	......	......	......	......	......	......

Ordnance, ordnance stores, clothing, etc.—Continued.

Articles.	Second Infantry.										
	Quarter-r.	Adjutant.	Company.								Total.
			A		C	D	E	F	G	H	
Small arms, appendage, accoutrements, etc.:											
Springfield rifle, cal. 45			50	50	53	52	60	50	49	50	414
Springfield rifle bayonets			50	48	57	50	50	53	50	50	408
Bayonet scabbards	2		50	55	82	51	68	51	66	80	505
Gun slings			50	63	55	50	71	50	50	50	439
Cartridge boxes	2		50	61	81	51	70	53	62	80	510
Waist belts	2	18	49	64	81	50	89	50	60	80	563
Waist belt plates	2	18	49	66	77	50	90	50	60	80	542
Knapsacks			49	50	49	30	55	50	47	41	371
Canteens	2		50	35	46	50	55	46	46	51	381
Canteen straps	2		50	35	46	50	55	46	46	47	377
Haversacks	2		47	41	48	50	55	50	45	42	380
Haversack straps	2		47	41	48	50	51	50	45	41	375
B. B cap screws						2		2			4
Spring or thumb vises			1		1	1	1	1	2		7
Tumblers			1	3	3			1	5	10	23
Tumbler punches			2			4		4	3		13
Sight covers			44	48	45	50	40	44			271
Headless shell extractors			18	20	19	25	15	2		9	108
Bridles						2		2	5		9
Bridle screws						2		2	5		9
Cam latch springs						3		2	5	25	35
Extractors						4		16		5	25
Ejectors								1			1
Ejector springs and spindles						5		5			10
Combination screw drivers			3	3				8	4		18
Firing pins						21	10	17	20		68
Firing pin screws						8		2	5		15
Main springs					1	9		1	5		16
Sears						5		6	5		16
Sear springs								1	5		6
Sear screws						2		2			4
Tumbler and hammer screws								2	5		7
Wiping rods			15	7	21	2	3	10	5	3	66
Arm chests							3	2			5
Field guns, equipments, etc.:											
Parrott gun and carriage			1								1
Parrott gun limber and chest			1								1
Ammunition:											
Ball cartridges, cal. 45			1,600	2,000	1,000	1,500	1,000	300	1,000	100	8,500
Blank cartridges, cal. 45				195	600		1,000		500		2,295
Sword and sabres, etc.:											
Officers' swords			3	3	3	3	3	3	3	3	24
Scabbards	5		3	3	3	3	3	3	3	3	29
Officers' sabres	5										5
Scabbards	5										5
Chamois sword and sabre cases	1		3	3		3	3	3		2	18
N. C. O. swords	1						1				2
N. C. O. scabbards	1						1				2
Horse Equipments:											
Saddles	6										6
Bridles	6										6
Housings, Gen. officers											
Saddle cloths, Gen. staff officers											
Saddle cloths, officers of Inf'ty	6										6
Spurs, pairs											
Colors and standards:											
U. S. flags, silk	1										1
State flags, silk	1										1
Flag staffs, jointed	2										2
Guidons											

Ordnance, ordnance stores, clothing, etc.—Continued.

Articles.	Second Infantry.										Total.
	Quarter-master.	Adjutant.	Company.								
			A	B	C	D	E	F	G	H	
Clothing:											
Helmets, complete	7	......	......	......	......	......	......	......	......	......	7
Campaign hats	3	19	65	84	72	57	80	60	70	85	595
Forage caps	5	17	71	84	79	85	80	63	60	78	622
Great coats	4	20	42	40	37	45	40	43	42	40	353
Uniform coats	4	......	......	......	......	......	......	......	......	......	4
Uniform coats, musicians'	......	......	......	......	......	......	......	......	......	......	......
Blouses	6	19	81	92	77	67	99	60	71	89	661
Trousers	6	19	65	88	77	76	93	60	89	98	671
Blankets	......	16	64	29	84	61	56	44	57	59	470
Crossed rifles, letters and figures	......	......	93	111	71	90	101	60	137	64	727
Leggins, pairs	2	......	60	77	58	53	66	60	60	67	503
Letters	......	......	......	......	......	......	......	......	......	......	......
Figures	......	......	......	......	......	......	......	......	......	......	......
Bugles, for caps	......	20	......	......	......	......	......	......	......	......	20
Cloth chevrons, sergt. maj., prs.	1	......	......	......	......	......	......	......	......	......	1
Cloth chevrons, Q. M. sergt., prs.	4	......	......	......	......	......	......	......	......	......	4
Cloth chevrons, color sergt., prs.	2	......	......	......	......	......	......	......	......	......	2
Cloth chevrons, hospital steward, prs.	1	......	......	......	......	......	......	......	......	......	1
Cloth chevrons, principal musician, prs.	......	......	......	......	......	......	......	......	......	......	......
Cloth chevrons, first sergt., prs.	2	......	1	1	1	1	2	1	1	......	9
Cloth chevrons, sergt., prs.	......	......	4	4	4	4	10	4	4	2	36
Cloth chevrons, corporal, prs	......	......	9	7	6	8	13	8	8	7	66
Chevrons, gold lace, sergt. major, prs.	2	......	......	......	......	......	......	......	......	......	2
Chevrons, gold lace, Q. M. sergt., prs	4	......	......	......	......	......	......	......	......	......	4
Chevrons, gold lace, color sergt., prs.	1	......	......	......	......	......	......	......	......	......	1
Chevrons, gold lace, hospital steward prs.	1	......	......	......	......	......	......	......	......	......	1
Chevrons, gold lace, principal musician, prs.	......	......	......	......	......	......	......	......	......	......	......
Chevrons, gold lace, war service, prs.	......	......	......	......	......	......	......	......	......	......	......
Chevrons, gold lace, State service, prs.	......	......	......	......	10	......	12	......	......	......	22
Trousers' stripes, sergt., prs	......	......	10	8	8	5	19	5	5	4	64
Trousers' stripes, corp'l, prs.	......	......	16	11	14	8	21	8	8	6	92
Trousers' stripes, musicians', prs.	......	......	......	......	......	......	......	......	......	......	......
Books:											
Laws, rules and regulations	5	......	5	5	5	5	5	5	5	2	42
Duty books	......	......	1	1	1	1	3	3	2	1	13
Enlistment records	......	......	1	1	2	1	3	3	1	1	13
U. S. drill regulations	5	......	5	5	5	5	5	5	5	2	42
Blunt's small arm firing	......	......	1	1	1	1	......	1	1	1	7
Manuals of guard duty	......	......	10	10	10	10	10	10	10	22	92
Security and information	4	......	1	1	1	1	1	1	1	1	12
Order books	......	......	......	......	......	......	1	......	......	......	1

Ordnance, ordnance stores, clothing, etc.—Continued.

Articles.	Third Infantry.										Total.
	Quarter-master.	Adjutant.	Company.								
			A	B	C	D	E	F	G	H	
Small arms, appendages, accoutrements, etc.:											
Springfield rifles, cal. 45			60	70	50	58	60	50	49	50	447
Springfield rifle bayonets			60	70	50	57	61	51	49	50	448
Bayonet scabbards			64	70	62	64	60	82	49	54	505
Gun slings			60	70	50	58	60	50	49	50	447
Cartridge boxes			64	76	59	61	62	81	54	54	511
Waist belts	6	20	65	76	53	49	63	81	51	54	518
Waist belt plates	6	20	65	76	55	60	60	81	51	54	528
Knapsacks			57	69	55	53	58	41			333
Canteens			50	60	50	50	49	44	50	48	401
Canteen straps			50	60	50	50	49	44	50	48	401
Haversacks			50	60	50	50	49	47	50	50	406
Haversack straps			50	60	50	50	49	47	50	50	406
B. B. capscrews									2	2	4
Spring or thumb vises			1	2	1	6	1		1	2	14
Tumblers			12								12
Tumbler punches			4	5	9	7	4	2	4	4	39
Sight covers					50	33	51	43	10	60	247
Headless shell extractors				10		20	18		2	10	60
Bridles				1					2	2	5
Bridle screws									1	2	3
Cam latch springs										1	1
Extractors						5					5
Ejectors						4					4
Ejector springs and spindles				5		4			4	4	17
Combination screw drivers			20			4	14	2	10	10	60
			12		10	15		6	10	10	63
Firing pins											
Firing pin screws									5	5	10
Main springs						6			2	2	10
Sears						5					5
Sear springs						4					4
Sear screws											
Tumbler or hammer screws						8			2	2	12
Wiping rods			60			5	54	32		10	161
Arm chests			3						3	3	9
Field guns, equipments, etc.:											
Parrott gun and carriage											
Parrott gun limber and chest											
Ammunition:											
Ball cartridges, cal. 45			700	2,000	2,000	1,000	2,400		1,800		9,900
Blank cartridges, cal. 45				500		300					800
Sword and sabres, etc.:											
Officers' swords			3	3	3	3	3	3	3	3	24
Scabbards			3	3	3	3	3	3	3	3	24
Officers' sabres	8										8
Scabbards	8										8
Chamois sword and sabre cases	8				1	2	4		3	3	21
N. C. O. swords	2					1					3
N. C. O. scabbards	2					1					3
Horse equipments:											
Saddles	5										5
Bridles	5										5
Housings, Gen. officers											
Saddle cloths, Gen. staff officers											
Saddle cloths, officers of infantry	5										5
Spurs, pairs	4										4
Colors and standards:											
United States flags, silk	1										1
State flags, silk	1										1
Flag staffs, jointed	2										2
Guidons											

Ordnance, ordnance stores, clothing, etc.—Continued.

Articles.	Third Infantry.										
	Quarter-master.	Adjutant.	Company.								Total.
			A	B	C	D	E	F	G	H	
Clothing:											
Helmets, complete	1										1
Campaign hats	5	20	63	60	59	53	65	61	60	66	512
Forage caps	6	20	58	87	80	59	78	91	60	79	618
Great coats	3		40	40	42	37	40	40	39	49	330
Uniform coats					3						3
Uniform coats, musicians											
Blouses	7	20	74	90	70	60	82	90	63	109	665
Trousers	8	20	79	90	71	58	83	91	61	109	670
Blankets	5		79	66	68	44	91	40	60	55	508
Crossed rifles, letters and figures			62	85	82	36	105	69	67	170	676
Leggins, pairs	13	20	71	65	60	68	66	94	60	70	582
Letters											
Figures											
Bugles for caps		6									6
Cloth chevrons, sergt. maj., prs	4										4
Cloth chevrons, Q. M. sergt., prs	2										2
Cloth chevrons, color sergt., prs	2										2
Cloth chevrons, H. S., pairs	1										1
Cloth chevrons, P. M., pairs		1									1
Cloth chevrons, 1st sergt., pairs			1	2	1	1	1		1	1	8
Cloth chevrons, sergeant, pairs			4	8	5	5	6	5	4	4	41
Cloth chevrons, corporal, pairs			8	16	14	11	12	8	8	9	86
Chevrons, gold lace, sergt major, pairs			1								1
Chevrons, gold lace, Q. M. sergt., pairs	1		2								3
Chevrons, gold lace, color sergt., pairs											
Chevrons, gold lace, H. S., pairs											
Chevrons, gold lace, P. M., pairs											
Chevrons, gold lace, W. S., pairs					2						2
Chevrons, gold lace, S. S., pairs	5			8	11				30		54
Trousers stripes, sergeant, pairs	8		7	10	8	9	9	5	5	5	66
Trousers stripes, corporal, pairs			8	16	17	10	12	8	8	8	87
Trousers stripes, musicians, pairs		18	2			2	2		2	2	28
Books:											
Laws, rules and regulations	15	1	5	6	5	4	5		5	5	51
Duty books			1	1	1	2	1		1	1	8
Enlistment records			1	1	1	2	1		1	2	9
U. S. drill regulations	9	1	5	5	5	5	5		5	4	44
Blunt's small arm firing			1	1		1	1				4
Manuals of guard duty		1	10	10	10	10	10		15	22	88
Security and information		3	1	1	1	1			1	1	9
Order books										1	1

Ordnance, ordnance stores, clothing, etc.—Continued.

Articles.	Fourth Infantry.										Total.
	Quartermaster.	Adjutant.	Company.								
			A	B	C	D	E	F	G	H	
Small arms appendages, accoutrements, etc:											
Springfield rifles, cal. 45	......	......	59	50	51	82	49	60	45	50	446
Springfield rifle bayonets	......	......	56	50	51	82	50	59	45	49	442
Bayonet scabbards	......	......	78	48	72	79	57	66	50	84	534
Gun slings	......	......	69	50	56	83	50	61	45	50	464
Cartridge boxes	......	......	81	76	75	82	56	69	50	84	573
Waist belts	......	20	83	71	72	84	58	71	50	83	592
Waist belt plates	......	20	83	75	72	86	57	71	50	80	594
Knapsacks	3	......	65	59	57	83	47	53	53	......	420
Canteens	3	......	42	48	43	50	48	32	50	49	365
Canteen straps	3	......	42	46	50	50	48	32	50	49	370
Haversacks	3	......	43	50	44	50	48	36	50	49	373
Haversack straps	3	......	43	50	50	50	48	36	50	49	379
S. B. cap screws	......	......	......	......	......	2	2	......	1	......	5
Spring or thumb vises	......	......	......	......	1	1	1	......	1	2	6
Tumblers	......	......	......	......	......	......	......	......	......	1	1
Tumbler punches	......	......	4	......	4	3	4	4	4	4	27
Sight covers	......	......	59	......	60	......	......	......	......	......	119
Headless shell extractors	......	......	10	......	8	20	20	10	20	......	88
Bridles	......	......	2	......	1	2	2	2	2	2	13
Bridle screws	......	......	2	......	1	5	2	2	1	2	15
Cam latch springs	......	......	......	......	2	......	2	......	......	4	8
Extractors	......	......	......	......	1	1	1	1	1	2	7
Ejectors	......	......	......	......	......	......	5	1	1	2	9
Ejector springs and spindles	......	......	3	......	3	7	5	......	6	......	24
Combination screw drivers	......	......	......	......	5	20	20	......	20	10	75
Firing pins	......	......	......	......	21	7	2	2	6	8	46
Firing pin screws	......	......	......	......	2	10	2	2	......	2	18
Main springs	......	......	......	......	1	......	1	1	1	2	6
Sears	......	......	......	......	......	......	1	......	......	2	3
Sear springs	......	......	......	......	1	......	1	1	......	2	5
Sear screws	......	......	......	......	1	......	2	......	......	2	5
Tumbler or hammer screws	......	......	......	......	25	3	2	......	1	......	31
Wiping rods	......	......	......	......	5	10	10	10	10	7	52
Arm chests	......	......	......	......	......	1	1	1	2	3	8
Field guns, equipments, etc.:											
Parrott gun and carriage	....	......	......	......	......	......	......	......	......	......	......
Parrott gun, limber and chest	......	......	......	......	......	......	......	......	......	......	......
Ammunition:											
Ball cartridges, cal. 45	......		3,000	1,650	2,000	3,000	1,100	2,500	2,200	2,000	17,450
Blank cartridges, cal. 45	......	......	......	......	......	200	......	......	......	......	200
Sword and sabres, etc.:											
Officers' swords	3		3	3	3	3	3	3	3	3	27
Scabbards	3	......	3	3	3	3	3	3	3	3	27
Officers' sabres	7	......	......	......	......	......	......	......	......	......	7
Scabbards	7	......	......	......	......	......	......	......	......	......	7
Chamois sword and sabre cases	10	......	3	......	3	3	3	......	3	3	28
N. C. O. swords	......	......	1	......	......	......	1	......	......	......	2
N. C. O. scabbards	......	......	1	......	......	......	1	......	......	......	2
Horse equipments:											
Saddles	7	......	......	......	......	......	......	......	......	......	7
Bridles	7	......	......	......	......	......	......	......	......	......	7
Housings, Gen. officer's	......	......	......	......	......	......	......	......	......	......	......
Saddle cloths, Gen. staff officers	......	......	......	......	......	......	......	......	......	......	......
Saddle cloths, officers of infty	7	......	......	......	......	......	......	......	......	......	7
Spurs, prs	7	......	......	......	......	......	......	......	......	......	7
Colors and standards:											
U. S. flags, silk	1	......	......	......	......	......	......	......	......	......	1
State flags, silk	1	......	......	......	......	......	......	......	......	......	1
Flag staffs, jointed	2	......	......	......	......	......	......	......	......	......	2
Guidons	4	......	......	......	......	......	......	......	......	......	4

Ordnance, ordnance stores, clothing, etc.—Continued.

Articles.	Fourth Infantry.										
	Quarter-master.	Adjutant.	Company.								Total.
			A	B	C	D	E	F	G	H	
Clothing:											
Helmets, complete	3	......	10	......	4	......	......	......	......	......	17
Campaign hats	3	20	83	50	60	75	50	80	60	75	556
Forage caps	3	20	72	65	82	88	68	66	62	83	609
Great coats	......	20	40	40	40	40	40	40	40	40	340
Uniform coats	3	......	......	......	......	......	......	......	......	......	3
Uniform coats, musician	......	......	......	......	......	......	......	......	......	......	......
Blouses	3	20	73	59	87	82	67	65	64	83	608
Trousers	3	20	77	72	63	87	76	70	64	82	614
Blankets	......	......	83	58	89	79	60	76	65	76	586
Crossed rifles, letters and figures	......	......	50	79	70	67	60	86	62	73	547
Leggins, pairs	3	20	75	45	78	79	56	83	50	74	563
Letters	......	......	......	......	......	......	......	......	......	......	......
Figures	......	20	......	......	......	......	......	......	......	......	20
Bugles for caps	......	20	......	......	......	......	......	......	......	......	20
Cloth chevrons, sergt. major, prs.	1	......	......	......	......	......	......	......	......	......	1
Cloth chevrons, Q. M. sergt., prs.	1	......	......	......	......	......	......	......	......	......	1
Cloth chevrons, color sergt., prs.	1	......	......	......	......	......	......	......	......	......	1
Cloth chevrons, hospital steward, prs.	1	......	......	......	......	......	......	......	......	......	1
Cloth chevrons, principal musician, prs.	......	1	......	......	......	......	......	......	......	......	1
Cloth chevrons, first sergt., prs.	......	......	2	2	2	1	1	1	1	2	12
Cloth chevrons, sergeant, prs.	......	......	8	5	9	4	5	4	4	8	47
Cloth chevrons, corporal, prs.	......	......	14	7	12	8	9	12	8	16	86
Chevrons, gold lace, sergt. major, prs.	1	......	......	......	......	......	......	......	......	......	1
Chevrons, gold lace, Q. M. sergt., prs.	1	......	......	......	......	......	......	......	......	......	1
Chevrons, gold lace, color sergt., prs.	......	......	......	......	......	......	......	......	......	......	......
Chevrons, gold lace, hospital steward, prs.	......	......	......	......	......	......	......	......	......	......	......
Chevrons, gold lace, principal musicians prs.	......	......	......	......	......	......	......	......	......	......	......
Chevrons, gold lace, war service, prs	......	......	......	3	......	......	......	......	......	......	3
Chevrons, gold lace, state service, prs.	......	......	12	25	35	25	6	18	25	25	171
Trousers, stripes, sergt., prs.	......	......	9	5	11	5	5	9	5	5	54
Trousers, stripes, corp., prs.	......	......	14	8	15	8	9	11	8	8	81
Trousers, stripes, musicians, prs.	......	20	......	......	......	4	......	......	2	4	30
Books:											
Laws, rules and regulations	......	......	5	5	5	5	5	5	5	5	40
Duty books	......	......	1	1	2	1	1	1	2	1	10
Enlistment records	......	......	1	1	2	1	1	1	2	1	10
U. S. drill regulations	5	......	5	7	5	8	5	5	5	8	53
Blunt's small arm firing	......	......	1	1	1	1	1	1	1	......	7
Manuals of guard duty	......	......	10	10	10	10	10	10	10	10	80
Security and information	3	......	1	1	1	1	1	1	1	1	11
Order books	......	......	......	......	1	......	......	......	......	......	1

Ordnance, ordnance stores, clothing, etc.—Continued.

Articles.	Fifth Infantry.										
	Quartermaster.	Adjutant.	Company.								Total.
			A	B	C	D	E	F	G	H	
Small arms, appendages, accoutrements, etc.:											
Springfield rifles, cal. 45	-----	-----	50	55	62	58	50	52	-----	51	378
Springfield rifle bayonets	-----	-----	49	57	62	62	50	55	-----	50	385
Bayonet scabbards	-----	-----	51	61	64	62	60	60	-----	65	423
Gun slings	-----	-----	50	58	62	59	50	55	-----	51	385
Cartridge boxes	---	---	54	62	68	78	60	90	-----	65	487
Waist belts	1	18	55	58	63	78	60	60	-----	65	458
Waist belt plates	1	18	55	61	63	78	60	60	-----	65	456
Knapsacks	-----	-----	39	38	64	65	-----	70	-----	65	341
Canteens	-----	-----	46	50	50	45	25	50	-----	48	314
Canteen straps	----	-----	47	48	50	45	25	50	-----	48	313
Haversacks	-----	-----	43	48	48	46	50	50	---	50	335
Haversack straps	-----	-----	44	46	48	46	50	50	----	50	334
B. B. Cap screws	-----	-----	-----	-----	-----	-----	-----	-----	-----	2	2
Spring or thumb vises	-----	-----	-----	1	1	1	1	1	-----	2	7
Tumblers	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Tumbler punches	-----	-----	-----	4	2	4	4	4	-----	4	22
Sight covers	-----	-----	-----	50	-----	-----	-----	-----	-----	-----	50
Headless shell extractors	-----	----	-----	20	-----	20	5	8	-----	8	61
Bridles	-----	-----	-----	-----	-----	-----	-----	-----	-----	2	2
Bridle screws	-----	----	-----	2	-----	-----	-----	-----	-----	2	4
Cam latch springs	-----	-----	----	-----	-----	-----	-----	-----	-----	1	1
Extractors	-----	-----	2	1	-----	-----	-----	-----	-----	2	5
Ejectors	-----	-----	1	-----	-----	-----	-----	-----	-----	1	2
Ejector springs and spindles	-----	-----	3	3	-----	-----	-----	6	----	1	13
Combination screw drivers	--- -	---	4	5	-----	10	5	-----	- ---	-----	24
Firing pins	-----	----	6	14	----	-----	-----	-----	-----	-----	20
Firing pin screws	-----	----	-----	-----	----	-----	----	-----	-----	-----	------
Main springs	-----	-----	----	2	-----	-----	-----	---	-----	----	2
Sears	-----	-----	4	2	7	-----	-----	-----	-----	-----	13
Sear springs	-----	-----	1	2	-----	-----	-----	-----	-----	-----	3
Sear screws	-----	-- -	-----	2	-----	-----	-----	-----	-----	-----	2
Tumbler or hammer screws	-----	-----	3	3	7	-	-----	-----	-----	-----	13
Wiping rods	-----	-----	14	25	5	60	-----	9	-----	-----	113
Arm chests	-----	-----	-----	1	4	3	2	3	-----	-----	13
Field guns, equipments, etc.:											
Parrott gun and carriage	-----	-----	-----	-----	-----	-----	-----	----	---	-----	-- --
Parrott gun limber and chest	-----	-----	-----	-----	-----	-----	- --	-----	-----	-----	-----
Ammunition:											
Ball cartridges, cal. 45	-----	----	1,900	2,400	1,850	2,300	1,000	1,500	-----	250	11,200
Blank cartridges, cal. 45	-----	-----	-----	------	900	500	-----	-----	-----	150	1,550
Sword and sabres, etc.:											
Officers' swords	-----	-----	3	3	3	3	3	3	----	3	21
Scabbards	-----	-----	3	3	3	3	3	3	----	3	21
Officers' sabres	6	-----	-----	-----	-----	-----	-----	-----	-----	-----	6
Scabbards	6	-----	-----	-----	---	-----	-----	----	-----	-----	6
Chamois sword and sabre cases	6	-----	1	-----	----	-----	-----	1	-----	3	11
N. C. O. swords	1	-----	----	-----	-----	4	----	-----	-----	-----	5
N. C. O. scabbards	1	----	-----	-----	-----	4	----	-----	-----	-----	5
Horse equipments:											
Saddles	7	-----	-----	-----	--	----	-----	-----	-----	---	7
Bridles	6	-----	-----	-----	-----	-----	---	-----	-----	-----	6
Housings, Gen. officers	------	-----	-----	-----	-----	-----	-----	-----	-----	-----	------
Saddle cloths, Gen. staff officers	------	-----	-----	-----	-----	-----	-----	-----	- -	-----	-----
Saddle cloths, officers of infty	7	-----	-----	-----	-----	-----	-----	-----	-----	-----	7
Spurs, pairs	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------
Colors and standards:											
U. S. flags, silk	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	1
State flags, silk	1	-----	-----	-----	-----	-----	-----	-----	-----	-----	1
Flag staffs, jointed	2	-----	-----	-----	-----	-----	-----	-----	-----	-----	2
Guidons	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----

Ordnance, ordnance stores, clothing, etc.—Concluded.

Articles.	Fifth Infantry.										Total.
	Quartermaster.	Adjutant.	Company.								
			A	B	C	D	E	F	G	H	
Clothing:											
Helmets, complete	......	20	......	......	......	......	......	......	......	......	20
Campaign hats	4	30	77	60	58	76	60	49	......	71	475
Forage caps	6	38	63	78	79	78	60	53	......	66	521
Great coats	......	20	38	38	40	43	40	55	......	51	325
Uniform coats	......	......	......	......	......	......	......	......	......	......	......
Uniform coats, musicians	......	25	......	......	......	......	......	......	......	......	25
Blouses	8	37	67	77	98	76	60	58	......	62	533
Trousers	6	33	82	89	98	63	60	56	......	63	545
Blankets	......	20	63	57	67	114	60	101	......	54	536
Crossed rifles, letters and figures	1	......	38	65	96	83	49	65	......	52	449
Leggins, pairs	5	24	69	70	50	64	60	60	......	71	478
Letters	......	......	......	......	......	......	......	......	......	......	......
Figures	......	10	......	......	......	......	......	......	......	......	10
Bugles for caps	......	30	......	......	......	......	......	......	......	......	30
Cloth chevrons, sergt. maj., prs	0	......	......	......	......	......	......	......	......	......	......
Cloth chevrons, Q. M. sergt., prs	0	......	......	......	......	......	......	......	......	......	......
Cloth chevrons, color sergt., prs	......	......	......	......	......	......	......	......	......	......	......
Cloth chevrons, hospital steward, prs	......	......	......	......	......	......	......	......	......	......	......
Cloth chevrons, principal musician, prs	0	1	......	......	......	......	......	......	......	......	1
Cloth chevrons, 1st sergt, prs	......	......	1	1	1	2	1	2	......	1	9
Cloth chevrons, sergt., prs	......	......	4	6	4	8	4	5	......	4	35
Cloth chevrons, corp., prs	......	......	8	9	......	14	8	8	......	8	55
Chevrons, gold lace, sergt. maj., prs	1	......	......	......	......	......	......	......	......	......	1
Chevrons, gold lace, Q. M. sergt., prs	2	......	......	......	......	......	......	......	......	......	2
Chevrons, gold lace, color sergt., prs	3	......	......	......	......	......	......	......	......	......	3
Chevrons, gold lace, hospital steward, prs	1	......	......	......	......	......	......	......	......	......	1
Chevrons, gold lace, prin. musician, prs	......	1	......	......	......	......	......	......	......	......	1
Chevrons, gold lace, war service, prs	......	......	......	......	......	......	......	......	......	......	......
Chevrons, gold lace, State service, prs	......	......	......	......	24	......	......	......	......	30	54
Trousers stripes, sergeant, prs	4	......	5	7	5	10	5	10	......	5	51
Trousers stripes, corporal, prs	......	......	8	9	8	16	8	8	......	8	65
Trousers stripes, musicians, prs	......	40	1	......	2	......	......	2	......	2	47
Books:											
Laws, rules and regulations	......	......	2	3	4	5	3	5	......	5	27
Duty books	......	......	1	1	1	1	1	1	......	1	7
Enlistment records	......	......	1	1	2	1	1	1	......	1	8
U. S. drill regulations	9	......	5	3	5	5	3	5	......	5	40
Blunt's small arms firing	......	......	......	......	1	1	......	......	......	......	2
Manuals of guard duty	......	5	10	5	10	10	10	10	......	20	80
Security and information	4	......	1	1	1	1	......	1	......	1	10
Order books	......	......	......	......	1	......	1	......	......	......	2

ANNUAL REPORT

OF THE

STATE SALT INSPECTOR

OF THE

STATE OF MICHIGAN

FOR THE

YEAR ENDING NOV. 30, 1896

BY AUTHORITY

LANSING, MICH.
ROBERT SMITH PRINTING CO., STATE PRINTERS AND BINDERS
1897

REPORT.

OFFICE OF GEO. W. HILL, STATE SALT INSPECTOR,
Saginaw, E. S., December 15, 1896.

HON. JOHN T. RICH, *Governor of the State of Michigan:*

SIR—I have the honor to transmit this, my fourteenth, the twenty-eighth annual report of the operations of the State salt inspection law, for the fiscal year ending November 30, 1896.

The law requires that the report shall contain:

First, The number of districts into which the salt producing territory of the State may then be divided, with the name and locality of each, and the number and capacity of the works in each district;

Second, The quantity and quality of salt inspected in each district, the preceding year;

Third, The amount of money received, and the expenses incurred under this act.

SALT DISTRICTS.

The salt producing territory of the State is divided into nine districts.

District No. 1, Saginaw county, has nineteen salt companies, with nineteen steam blocks and three thousand solar salt covers, having a manufacturing capacity of one million barrels of salt.

District No. 2, Bay county, has eighteen salt companies, with seventeen steam and one vacuum pan blocks, with a manufacturing capacity of one million barrels of salt.

District No. 3, Huron county, has one salt company, with one steam block with a manufacturing capacity of twenty-five thousand barrels of salt.

District No. 4, St. Clair county, has six salt companies, with one steam and five pan blocks, with a manufacturing capacity of one million barrels of salt.

District No. 5, Iosco county, has six salt companies, with six steam blocks, with a manufacturing capacity of two hundred thousand barrels of salt.

District No. 6, Midland county, has two salt companies, with two steam blocks, with a manufacturing capacity of twenty-five thousand barrels of salt.

District No. 7, Manistee county, has eleven salt companies, with nine steam and three pan blocks, with a manufacturing capacity of two million barrels of salt.

District No. 8, Mason county, has three salt companies, with three steam and two pan blocks, with a manufacturing capacity of seven hundred and fifty thousand barrels of salt.

District No. 9, Wayne county, has three salt companies, with two open and two vacuum pan blocks, with a manufacturing capacity of five hundred thousand barrels of salt.

RECAPITULATION.

Number of firms and blocks engaged in the manufacturing of salt during the fiscal year 1896.

Total number of firms, sixty-nine.

Total number of blocks, seventy-three.

Solar salt covers, three thousand.

With an estimated manufacturing capacity of six million five hundred thousand barrels of salt.

DISTRICT NO. 1, SAGINAW COUNTY.

For whom inspected.	Fine salt. Barrels.	Fine salt, bulk.	Packers. Barrels.	Fine packers Barrels.	Solar.	Second quality. Barrels.	Total. Barrels.
Bliss & Van Aukin, No. 1	19,905						19,905
Bliss & Van Aukin, No. 2	40,212	28		108			40,348
Brand & Hardin	8,020						8,020
Wright Lumber Co	37,675	5,467					43,142
C. K. Eddy & Sons	42,718	7,110					49,828
Linton Manufacturing Co	8,372	7,811					16,183
A. T. Brown					27,405		27,405
E. Gremain		10,628					10,628
Saginaw Lumber & Salt Co	34,424						34,424
Tyler & Son	7,005					97	7,102
A. T. Bliss	19,798	114				1,946	21,858
C. L. Grant & Co	4,817					94	4,911
Eastman Lumber Co	2,710	4,194					6,904
Brewer Lumber Co	9,200	1,398					10,598
C. Merrill & Co	32,709	8,593					41,302
W. B. Mershon & Co		15,235					15,235
D. Hardin & Co	1,445						1,445
Central Lumber Co	31,561	336				495	32,392
Melbourne Salt Co		27,301				207	27,508
Arthur Simpson	5,789	2,107					7,896
L. Tait					1,464		1,464
Total	306,360	90,317		108	28,869	2,839	428,493

DISTRICT NO. 2, BAY COUNTY.

For whom inspected.	Fine salt. Barrels.	Fine salt, bulk.	Packers. Barrels.	Fine packers. Barrels.	Solar.	Second quality. Barrels.	Total. Barrels.
Carpenter & Co.	15,174					180	15,354
Smalley & Woodworth		20,546					20,546
Wm. Peters	8,006					63	8,069
F. E. Bradley	23,997	5,081					29,078
E. Hall		22,503					22,503
J. Boyce	11,553						11,553
Wm. Rouse	16,101					267	16,368
McEwan Bros. & Co.	21,450	4,938					26,388
Eddy Bros. & Co.	45,020	2,371					47,391
C. C. Barker		16,621				150	16,771
South End Lumber Co.	29,125						29,125
Theo. Hine	5,976	2,222					8,198
Pitts & Co.	35,416						35,416
Fitch Salt Co.	10,251	26,087				2,187	38,525
Michigan Pipe Co.		5,709					5,709
Bay City Manufacturing Co.	919	12,783				628	14,330
Kerns Manufacturing Co.	2,241	14,349	3,120				19,710
Total	225,229	133,210	3,120			3,475	365,034

DISTRICT NO. 3, HURON COUNTY.

For whom inspected.	Fine salt. Barrels.	Fine salt, bulk.	Packers. Barrels.	Fine packers. Barrels.	Solar.	Second quality. Barrels.	Total. Barrels.
Huron Dairy Salt Co.	2,665						2,665
Total	2,665						2,665

DISTRICT NO. 4, ST. CLAIR COUNTY.

For whom inspected.	Fine salt. Barrels.	Fine salt, bulk.	Packers. Barrels.	Fine packers. Barrels.	Solar.	Second quality. Barrels.	Total. Barrels.
Thompson Bros.	92,169						92,169
Davidson & Wansey	108,563					129	108,692
Diamond Crystal Salt Co.	54,182						54,182
Marine City Stave Co.	22,719		400				23,119
Walton Salt Co.	12,960						12,960
Michigan Salt Works	19,845						19,845
Total	310,388		400			129	310,917

DISTRICT NO. 5, IOSCO COUNTY.

For whom inspected.	Fine salt. Barrels.	Fine salt, bulk.	Packers. Barrels.	Fine packers. Barrels.	Solar.	Second quality. Barrels.	Total. Barrels.
Iosco Brine Supply Co.	3,326						3,326
Pack, Woods & Co.	56,292						56,292
Holland, Emery L. & S. Co., No. 1.	26,675						26,675
Holland, Emery L. & S. Co., No. 2.	43,422						43,422
Total	129,715						129,715

DISTRICT NO. 6, MIDLAND COUNTY.

For whom inspected.	Fine salt. Barrels.	Fine salt, bulk.	Packers. Barrels.	Fine packers. Barrels	Solar.	Second quality. Barrels.	Total. Barrels.
Wm. Patrick	20,900						20,900
Midland Salt & Lumber Co.	2,500	184				774	3,458
Total	23,400	184				774	24,358

DISTRICT NO. 7, MANISTEE COUNTY.

For whom inspected.	Fine salt. Barrels.	Fine salt, bulk.	Packers. Barrels.	Fine packers. Barrels	Solar.	Second quality. Barrels.	Total. Barrels.
Filer & Sons	88,181					606	88,787
State Lumber Co.	190,090	72,351				3,199	265,640
Eureka Lumber Co.	163,042					2,399	165,441
Louis Sands	161,279	19,273				340	180,892
Canfield & Wheeler	487	68,876	358	3,546		23	72,740
Union Salt & Lumber Co.	97,049	12,087	15			1,305	110,456
Reitz Salt & Lumber Co.	79,825						79,825
Michigan Trust Co.	251,006	5,928				5,873	262,807
Canfield S. & L. Co. (Channel)	81,108		2,548			556	84,212
Canfield S. & L. Co. (E. Lake)	105,534	21		175		179	105,909
Total	1,217,551	178,036	2,921	3,721		14,480	1,416,709

DISTRICT NO. 8, MASON COUNTY.

For whom inspected.	Fine salt. Barrels.	Fine salt, bulk.	Packers. Barrels.	Fine packers. Barrels.	Solar.	Second quality. Barrels.	Total. Barrels.
Pere Marquette Lumber Co.	77,941	12,455				83	90,479
Butters & Peters	94,800	15,924				3,379	114,103
Thos. Percy, No. 1	38,489	53,881	4,472				96,842
Thos. Percy, No. 2	106,002	77,498				1,812	185,312
Thos. Percy, No. 3	57,158	4,289				260	61,707
Total	374,340	163,497	4,472			5,534	547,843

DISTRICT NO. 9, WAYNE COUNTY.

For whom inspected.	Fine salt. Barrels.	Fine salt, bulk.	Packers. Barrels.	Fine packers. Barrels.	Solar.	Second quality. Barrels.	Total. Barrels.
Detroit Salt Co.	87,841	19,966	153			2,548	110,508
Total	87,841	19,966	153			2,548	110,508

RECAPITULATION.

District and county.	Fine salt. Barrels.	Fine salt, bulk.	Packers. Barrels.	Fine packers. Barrels.	Solar.	Second quality. Barrels.	Total. Barrels.
District No. 1, Saginaw county	306,360	90,317		108	28,869	2,839	428,493
District No. 2, Bay county	225,229	133,210	3,120			3,475	365,034
District No. 3, Huron county	2,665						2,665
District No. 4, St. Clair county	310,388		400			129	310,917
District No. 5, Midland county	23,400	184				774	24,358
District No. 6, Iosco county	129,715						129,715
District No. 7, Manistee county	1,217,551	178,036	2,921	3,721		14,480	1,416,709
District No. 8, Mason county	374,340	163,497	4,472			5,534	547,843
District No. 9, Wayne county	87,841	19,966	153			2,548	110,508
Total	2,677,489	585,210	11,066	3,829	28,869	29,779	3,336,242

There was, from the above table, 193,120 barrels less inspected than in 1895, but this does not show the amount actually manufactured during the year 1896.

	Barrels.
Add to the total amount inspected	3,336,242
Salt now in bins	738,952
Total	4,075,194
Deduct salt in bins November 30, 1895	999,280
Amount of salt manufactured during fiscal year 1896	3,075,914